

## PERSONALITIES

By George F. Taubeneck

### The New Deal In a Small Town

Last week-end the writer, like Eliza, made a perilous crossing of the ice. Motoring some 500 miles down to Marshall, Illinois (our home town) over glassy and treacherous roads, the air was so thoroughly refrigerated that we began to wish for some of the impervious qualities of the fabled brass monkeys.

But the air wasn't all that was frigid around Marshall. We found the town, as a whole, rather cold toward the New Deal.

Of course there were exceptions. The editor of the *Clark County Democrat*, for whose encouragement and gentle guidance in days gone by your correspondent will be forever grateful, and who fought the good fight for a long stretch of lean years, now is enjoying the fruits of a state job. So is his son, who married the only good-looking Taubeneck in captivity.

A former garage owner who went busted in a large way at the beginning of the depression, and who lived on the dubious charity of friends until quite recently, now opens a door at the State House in Springfield three mornings a week, 18 weeks a year. The rest of the time is his own (another payroll closes the door in the evening).

The coach of the championship high school football team feels grateful to the AAA, which pays the farmers not to work—hence their sons have little

or nothing to do, and so they come to high school. These farm boys make rugged guards and tackles, and out of the crop the coach got one first-class fullback, too.

But three farmers we talked to, all fairly large landholders for that section, think that the AAA is the "biggest flock of nonsense since William Jennings Bryan." The business of farmers, they affirm, is to farm.

Publisher HARRY POTTER of *The Marshall Herald*, for whom this writer went to work at the age of 10 as a printer's devil and press feeder, is now growing a mustache. He says that it's about the only activity he knows of today that isn't subject to taxation. But he wonders if the AAA would pay him for not raising a mustache.

Mr. Potter says that the farmers who are getting AAA money aren't the ones who really need it, or the kind who will spend it. They are socking it in the bank.

Treasurer EARL MORRIS of the Marshall State Bank says deposits are high, and that they have more money on hand than they know what to do with—there's no place to invest it.

The writer's father, a druggist, finds the state 3 per cent sales tax a handicap. People drive 16 miles to Terre Haute, Indiana, for purchases to avoid this tax (Indiana has none). However, Dad's partner, JOHN DAVISON, a lifelong Democrat, is an ardent New Deal supporter.

General impression gained from

shopkeepers and professional men about this town of 2,400 population is that business is still rotten, and that the New Deal has probably hurt more than it has helped.

### Something New in Skits

One of the cleverest dramatic skits we've seen in a long time—and one of the most effective, too, if the cheers of distributors are any indication—was "One Picture Is Worth 10,000 Words," presented at Stewart-Warner's distributors' convention last week in Chicago.

The playlet emphasizes the importance of proper display by having a deaf mute, its principal character, demonstrate and sell a refrigerator without outside assistance of any sort.

As the skit opens, Abe Cohen and Hank Donovan, proprietor and salesman for the "Enterprise Electrical Utilities Co.," are talking loudly about the sale of a 9-cu. ft. job they hope to make. But talk is about all they do.

While they loiter, Jess Showit, a tall, well-dressed young man, enters, takes out a pad, and writes on it: "My name is Jess Showit. I'd like a job selling the new Stewart-Warner line."

Naturally, the men are amazed at this introduction; still more amazed, when they discover their applicant is a "dummy," as Abe says. But they ask him to wait, and go out to lunch together to talk the situation over.

Alone in the store (the stenographer has gone to lunch, too), Jess rearranges the appliances in good-looking, attractive groups, cleans up the dirty showroom, and generally fixes things as a showroom should be.

Mrs. Prospect enters, attracts Jess' attention, asks to look at a refrigerator of suitable size for a family of three. He is, of course, speechless.

From here on, the skit is largely in pantomime, with Jess leading Mrs.

Prospect through a complete demonstration. When she asks questions, he answers them by simple demonstrations and comparisons.

As a last objection, she raises the question: "I like this model very much—it would just about suit me, but I've seen an ad somewhere of a box that has shelves built here on the inside of the door, and I don't know but what that would be a grand thing to have in one's refrigerator. I only wish this Stewart-Warner included such a feature!"

This is Jess' cue to remove the "Sav-a-Step," S-W's 1936 convenience feature, and drop it into place in the sockets on the door.

Mrs. Prospect has just been sold, and is asking about a monthly payment plan, when Abe and Hank return from lunch. Abe leads Mrs. Prospect to his office, and asks Jess to follow, "since you are going to work here."

"Your man is very considerate," Mrs. Prospect tells Abe. "He manages to show you everything you want to know without talking your arm off."

"Yes, silent fellow, Jess," replies Abe, "but he seems to have an uncanny way of knowing just what people want."

All of which leads Hank to surmise, as he scratches his head, that "I guess I'm dumb—either that or else this Stewart-Warner is so hot it sells itself if you show it right!"

### Dynamic Detroit

If they picked an All-American city for 1935, Detroit would be so far ahead of the others that there just wouldn't be any competition. At least, that's what we say.

Of course, we're only an adopted citizen, dropped in here five years ago from the wilds of Illinois, but just the same we can't help feeling pretty good about it.

Let's look at the record:

First off, Detroit has led the nation back onto the path of industrial recovery. The city's factories have had their busiest period in five years—especially the automotive factories, backbone of its industrial life. That's championship No. 1.

Then came MICKEY COCHRANE's Tigers, to capture their second straight American League pennant, and their first world's baseball championship from the Chicago Cubs. That's title No. 2.

JOE LOUIS, a struggling young heavyweight at the beginning of the year, and now known variously as the Brown Bomber, the Dark Destroyer, the Sepia Scourge, and the Dusky Dynamiter, blasted his way through Carnera, Baer, and Levinsky to a place right on the top step of King JIMMY BRADDOCK's heavyweight throne. When they meet, that will be championship No. 3.

What clinched All-American honors for Detroit, in our opinion, was the Lions' recent victory over the New York Giants for the National Professional Football League championship. The Lions' victory was typical of all of Detroit's triumphs—the result of the will to win, even against overpowering odds.

With four games to go, the Lions were third in their own division, needing at least three victories and a tie to finish ahead. They got them—and then went on to whip the Giants, eastern division winners, by the lopsided score of 26 to 7.

Leading the Lions in their victory drive was DUTCH CLARK, captain and quarterback, the greatest ball carrier and field general of all time.

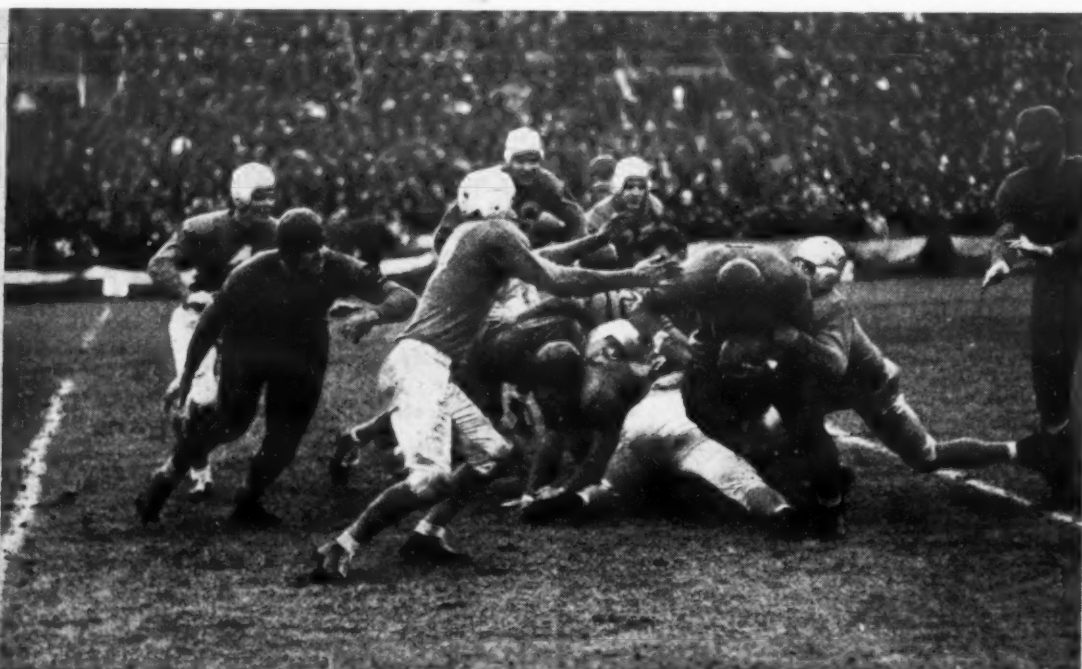
And so this week we present our annual football picture strip, like last year's, of the Lions-Chicago Bears game. Our pictures of last year's Thanksgiving Day game received a lot of favorable comment. We hope these do as well.



Norge distributors, here for their annual meeting early this month, were so intent on 1936 prospects that they couldn't stop talking shop, even at the banquet table. (1) Pete Sampson (center), Chicago distributor, discusses next year's chances with two of his fellows. (2) "Norge will be a wow in 1936!" Mr. Sampson says it with gestures. (3) Glen O'Harra, range sales supervisor, gives some pointers to B. H. Spinney, Springfield, Mass., distributor. (4) One of the speakers at the banquet was Wilbur Arthur, vice president of Paul Block newspaper chain.



Preparing for his 'round the world trip in the interests of refrigeration and air conditioning, the editor went to New York and obtained suggestions from these officials of International General Electric Co. (1) E. C. Pangburn, manager of IGE's refrigeration department. (2) J. C. Douglas explained market conditions in Mexico, from which he has just returned. (3) H. A. Granary, director of G-E sales in France, with headquarters in Paris. In that country, G-E operates under the name "Frigecco."



Two action pictures of the Detroit Lions-Chicago Bears professional football game on Thanksgiving day. The Lions won, 14 to 2. (1) Bill Hewitt, Bear end (helmetless) runs interference for a play that went wrong. The ball-carrier is being brought down just behind him. (2) "Bronko" Nagurski of the Bears is stopped at the line of scrimmage.



## REFRIGERATION NEWS

Registered U. S. Patent Office

ESTABLISHED 1926. MEMBER AUDIT BUREAU OF CIRCULATIONS. MEMBER ASSOCIATED BUSINESS PAPERS.

VOL. 17, No. 1, SERIAL NO. 354  
ISSUED EVERY WEDNESDAYEntered as second-class  
matter Aug. 1, 1927

DETROIT, MICHIGAN, JANUARY 1, 1936

Copyright, 1936, by  
Business News Pub. Co.THREE DOLLARS PER YEAR  
TEN CENTS PER COPY**Air Conditioning  
Sales for 1935  
Show 80% Gain****\$35,000,000 Spent During  
Year for Conditioning  
Equipment**

WASHINGTON, D. C.—Tentative figures on sales of air-conditioning equipment for 1935 indicate that the dollar volume will be at least 80 per cent greater than it was in 1934, reports W. B. Henderson, executive vice president of Air Conditioning Manufacturers Association.

The American public paid more than \$35,000,000 for conditioning equipment in the year just closed, Mr. Henderson states, according to estimates on incomplete sales totals.

Final figures on 1935 sales and dollar volume will be made available in the near future.

The figures cover only what is considered true air conditioning, Mr. Henderson pointed out. "True air conditioning is equipment which, in summer, cools, dehumidifies, and circulates the air; and, in winter, heats, humidifies, and circulates the air. Most air-conditioning installations also clean the air and eliminate noises.

"Such single items of equipment as deodorizers, humidifiers, and air fans, are not in themselves air conditioners, although they are sometimes offered to the public as such," Mr. Henderson added.

Important buyers of conditioning equipment last year included retail merchants, manufacturers in the textile, confectionery, chemical, packing, steel, and other industries, hospitals, doctors, dentists, and other professional men, and private homes.

1936 should see an increasing use of air conditioning in homes, Mr. Henderson believes. A large portion of the residence construction planned for this year will make provision for air conditioning, either as a primary installation, or for later addition, he thinks.

Beauty parlors, barber shops, restaurants, hotels, and similar service establishments, where customer comfort is essential to sales, contributed largely to the growth of air conditioning last year. This type of user will again be one of the largest markets for conditioning equipment this year, Mr. Henderson says.

**Williams Air-O-Matic  
Uses Absorption Unit**

BLOOMINGTON, Ill.—Year-round air-conditioning units providing cooling through a new type of absorption refrigeration unit, and heating by low pressure steam through indirect steam radiation, have just been introduced by Williams Oil-O-Matic Heating Corp. and will be marketed under the name "Air-O-Matic."

Claimed for the absorption refrigeration unit in this new conditioner is high thermal efficiency, low power input, freedom from noise, simplicity in mechanical parts, low operating pressures, freedom from fire and

(Concluded on Page 4, Column 1)

**Right to Approve Conditioning Engineering  
Exercised by San Joaquin Power Co.**

FRESNO, Calif.—Through an agreement with a number of manufacturers of air-conditioning equipment the San Joaquin Light and Power Co. has obtained the right to approve the engineering on all air-conditioning jobs in which the equipment of these manufacturers is used. All leading national manufacturers are cooperating.

The arrangement was adopted on the recommendation of the power company as a protection for the future air-conditioning market. Power company officials contended that if small dealers sold a lot of poorly engineered jobs at the outset and customers weren't satisfied, the market would be greatly retarded.

Worth of the plan may be judged from the fact that power company air-conditioning load has more than tripled every year since the first installations were made. The only un-

**Kelvinator to Hold  
Big Convention in  
Detroit, Jan. 8-10**

DETROIT—In a convention of the old time variety with distributors and most of their executive personnel journeying here, the like of which Kelvinator Corp. hasn't staged since 1930, Kelvinator product and sales plans for 1936 will be divulged Jan. 8 to 10.

Nearly 1,000 distributors of Kelvinator products and their sales managers, sales promotion managers, advertising managers, wholesale men, and representatives of utility companies from all parts of the country will gather here for the three-day meeting, declares H. W. Burritt, vice president in charge of sales.

For the past few years Kelvinator Corp. has been staging regional conventions for groups of distributors, instead of a centralized "factory" conclave.

Convention headquarters will be in the Book-Cadillac hotel here. Meetings will be held at the Wilson theater.

Plans for 1936 will be graphically presented by factory personnel in some 30 specially staged presentations and skits.

All products manufactured by Kelvinator—including household refrigerators, commercial refrigeration units, water coolers, beverage coolers, air conditioners, and electric ranges—will be presented at the convention. Sales and advertising programs will be announced and discussed.

**Engineers to Discuss  
Comfort Conditions**

CHICAGO—Phases of the air-conditioning problem as it relates to the actual comfort of people will be one of the principal subjects discussed at the technical sessions of the Forty-Second Annual Meeting of the American Society of Heating and Ventilating Engineers the week of Jan. 27 at the Palmer House here.

Program for the sessions, just released by the Society, reveals such subjects for talks as "Subjective Reactions of Human Beings to Certain Outdoor Atmospheric Conditions"; "Minimum Ventilation Requirements from the Standpoint of Body Odor"; "Comfort Standards for Summer Air Conditioning."

Other papers will deal with the influence of storm sash on fuel saving.

(Concluded on Page 2, Column 4)

**Davis Takes Leavenworth's  
Post at Westinghouse**

EAST PITTSBURGH—R. R. Davis, assistant manager of the advertising department of Westinghouse Electric & Mfg. Co., will succeed Ralph Leavenworth, who recently resigned as manager of all Westinghouse advertising, reports N. G. Symonds, vice president.

Mr. Leavenworth will join Fuller & Smith & Ross, Cleveland advertising agency which handles the Westinghouse account.

**7 1-4 Million Electric Refrigerators  
Now in Use in U. S. Homes**

Estimated total number of household

electric refrigerators sold by all

U. S. manufacturers up to Dec. 31, 1934.....7,275,000

Estimated sales during 1935.....1,700,000

Estimated total world sales by all

U. S. manufacturers up to Dec. 31, 1935.....8,975,000

Deduct:

Total exports up to Dec. 31, 1934.....450,000

Plus exports during 1935.....133,000

Total exports up to Dec. 31, 1935.....583,000

Total sales in U. S. up to Dec. 31, 1935.....8,392,000

Deduct:

Obsolescence and replacement up to

Dec. 31, 1934.....875,000

Plus obsolescence and replacement

during 1935.....142,000

Total obsolescence and replacement up to Dec. 31, 1935.. 1,017,000

7,375,000

Deduct stocks in hands of distributors and dealers..... 125,000

Estimated total in use in U. S. on Jan. 1, 1936..... 7,250,000

Divide by number of wired homes in U. S.....21,204,354

Percentage of market saturation ..... 34.2

**Analysis of '35 Records  
Shows Sales Gain in  
Low-Income Market**

DETROIT—Invasion of the low-income class market, long a goal of electric refrigerator manufacturers, took major strides forward this year, an examination of the industry's sales records shows.

Most striking proof of this assertion is the fact that of sales in the first 11 months made by companies who are members of the Refrigeration Division of National Electrical Manufacturers Association, 98,987 refrigerators were under 4 cu. ft. capacity, as compared to 38,151 cabinets of less than 4 cu. ft. capacity sold in the same period last year.

The estimated average retail price of \$166, as compared with \$172 last year, also gives strength to the idea that more smaller and lower-priced refrigerators were sold, as there were no price reductions of any great consequence by major manufacturers this year.

Assuming that December sales by manufacturers will be as good, if not better, than November sales, it is estimated that world sales by all U. S. manufacturers during 1935 will total 1,700,000 units. This will top by more than 300,000 units the record set in 1934.

Making deductions for stocks in the hands of dealers and distributors, exports, and obsolescence and replacement, the number of refrigerators in use in the United States at the start of the year 1936 is approximately 7,250,000 units. The market saturation point stands at 34.2 per cent.

**New York Code Hearings  
Adjourned to Feb. 5**

NEW YORK CITY—Hearings before the Board of Hazardous Trades on New York City's proposed ordinance relating to refrigerating systems have been adjourned until Feb. 5, Deputy Fire Commissioner F. X. Glaccone has announced.

At that time a new revision of the code incorporating some of the suggested changes made at the three public hearings will be discussed.

**Fedders New York Branch  
Moved to Larger Quarters**

NEW YORK CITY—Branch office of the Fedders Mfg. Co. here has been moved to larger quarters at 114-116 East 16th St.

**Sales in November of  
57,027 Units Set  
New Record**

DETROIT—Setting an all-time record for the month, sales of household electric refrigerators during the month of November zoomed to 57,027 units, to bring the total for the first 11 months of 1935 to 1,643,269, according to estimates by ELECTRIC REFRIGERATION NEWS.

November's sales record is 337 above the all-industry total for October, when sales of 56,690 units were reported, and 21,327 above the mark for November, 1934, when 35,700 units were sold.

Best November the industry had previously known was in 1931, when sales were estimated at 39,600 units. The 1935 mark for the month exceeds that figure by 17,427.

Most encouraging factor for the industry, however, is the indication, as shown by figures for November as well as for the entire last quarter of 1935, that distributor and dealer outlets are no longer going into hiberna-

(Concluded on Page 4, Column 4)

**Kansas City Sales Total  
730 Units in November**

KANSAS CITY, Mo.—Sales of household electric refrigerators to consumers in Kansas City during the month of November totaled 730 units, as compared with 319 units sold in the same month last year, reports G. W. Weston, secretary-manager of the Electric and Radio Association of Kansas City.

Participation of 10 distributors of electric refrigerators in the Kansas City Auto Show Nov. 20-Dec. 7 helped to boost November sales, believes Mr. Weston. The distributors, who exhibited in a special section, were participating in the auto show for the first time in the history of the event.

At a recent meeting of the Association, Walter S. Blue, vice president and treasurer of the Columbian Electrical Co., Westinghouse distributor, was elected president of the organization. Two of the vice presidents of the Association for 1936 will be E. J. Goetze, president, Midwest Grunow Co., Grunow distributor; and J. G. Suor, vice president, Moser & Suor, Inc., Norge distributor.

A call has been sent to distributors and dealers of electric refrigerators to organize a cooperative effort to counteract the 1936 program of the National Association of Ice Industries.

**Entire G-E Line  
To Use Sealed  
Machine Units****Three Lines Are Shown  
In Special Previews  
Throughout Country**

CLEVELAND—General Electric's 1936 line of household electric refrigerators, now being introduced at a series of special "previews" throughout the country, incorporates a number of refinements and changes in construction and convenience features, and a distinctive new "V line" styling in the Flatop models.

All three lines of G-E refrigerators—Monitor Top, Flatop, and Liftop—now have the sealed unit.

Models in the Flatop series will be known as the "V line" because of the new styling on the doors which follows automobile radiator design of recent years. Radius of the cabinet corners has been increased, G-E engineers declaring that this gives greater strength and rigidity.

In both the Monitor Top and Flatop lines, stainless steel doors, readily removed or installed, have been placed on the evaporator, which has been moved to the center of the cabinet for better appearance and better utilization of the cabinet interior.

New features of the new Monitor Top models include a "different" Monitor Top, control of modern design with control defrost position, stainless steel cooling unit with stainless steel door, aluminum ice trays with tapered metal dividers or rubber grid, foot pedal door opener, ice tray release with hanger arrangement of door.

Model M-5 replaces the X-5. Models M-5 and M-6 are equipped with a glass chiller tray, three full-sized wire

(Concluded on Page 2, Column 1)

**1936 Spartans to Be  
Shown Next Week**

JACKSON, Mich.—The 1936 line of Spartan refrigerators will be unveiled to distributors next Tuesday and Wednesday, Jan. 7 and 8, at the annual convention of the Sparks-Withington Co. refrigeration distributors at the factory here.

Spartan models will have a completely redesigned cabinet, and numerous improvements in the refrigerating system, according to advance information released by Sparks-Withington officials.

The Antifrost clock will be retained, as well as the other convenience features which marked the 1935 line.

**Fedders Field Salesmen  
Meet at Factory**

BUFFALO—Annual mid-winter sales convention of Fedders field representatives was held at the Fedders factory here last Thursday, Friday, and Saturday, with representatives covering all territories from New York to Texas in attendance.

First day's program was devoted to engineering discussions presided over by L. C. Smith, executive engineer, and Joe Askin, chief engineer.

Sales and advertising plans for 1936 were presented on Thursday by H. E. Rieckelmann, assistant to the president; W. D. Keefe, sales manager, refrigeration division; and Horace Laney, advertising counsel.

Saturday was devoted to personal conferences with engineering and sales executives covering specific engineering and sales developments.

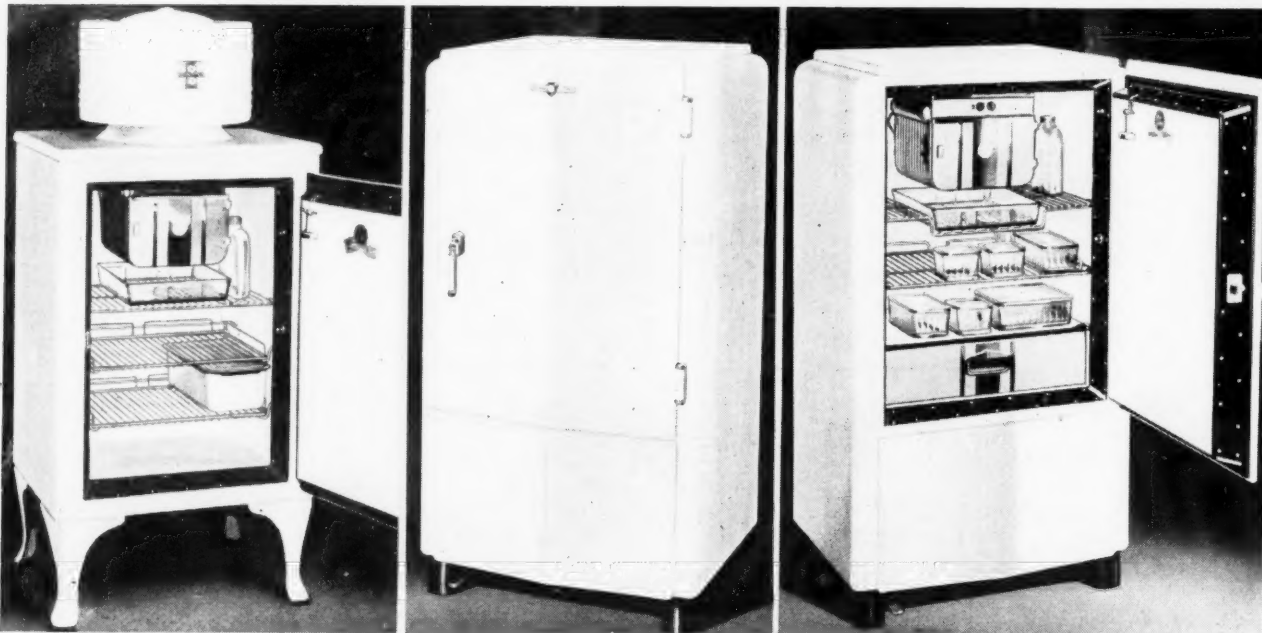
**35,000 Refrigerators Are  
Sold in St. Louis in 1935**

ST. LOUIS—In comparison with 30,000 electric refrigerators sold in 1934 by St. Louis dealers, C. H. Christine, secretary of the St. Louis Electric Board of Trade, estimates that 1935 brought sales of 35,000 units in the local metropolitan area. Sale of electric ranges has risen 296 per cent in the past year, says Mr. Christine.

In the St. Louis territory there are 40 distributors and 686 dealers in electrical appliances.



## G-E Products for 1936 Market



At the left is the G-E 1936 Monitor Top, with its new-styled control. Also new is the chromium-finished door on the freezing unit. In the center is an exterior view of a 1936 G-E Flatop model, demonstrating the "V-line" styling on the door. At the right is Model V-7 of the Flatop line, with door opened to show various features.

### G-E Employs Sealed Units in All 3 Lines Of 1936 Refrigerators

(Concluded from Page 1, Column 5) shelves, porcelain vegetable pan, and automatic interior light. The M-6 also is equipped with a water bottle. The M-7, in addition to the above features and equipment, has one full-sized flat wire shelf and two full-sized sliding shelves.

Hardware is of semi-concealed modern design, made of durable hard brass and finished in highly polished chrome with white inserts. Door latch is single action and self-sealing.

Cabinets are of all-steel construction, consisting of a one-piece outer shell and a one-piece steel inner liner. Insulation is protected against moisture by the outer shell which is sealed at all joints. Door openings and door edges are faced with Textolite strips secured to the inner and outer panels with corrosion resistant screws. Interiors of cabinets are finished in white acid-resistant porcelain and exteriors are bonderized.

The new 9-ft. refrigerator in the G-E 1936 line is the TM-9. Its features are essentially the same as the other models, including the new unit escutcheon plate, chilling unit door, and water bottle. A set of glass dishes also is included as standard equipment. In addition to the various features of the smaller models, the TM-9 is equipped with two vegetable drawers for fruits and vegetables.

Storage capacities, shelf areas, and ice-making capacities are as follows:

Model No.	Capacity (net cu. ft.)	Shelf Area (sq. ft.)	No. of Cubes	Lbs. Per Freezing
M-5	5.1	8.9	40	6
M-6	6.4	11.8	84	8
M-7	7.2	12.5	84	11
TM-9	9.6	16.1	84	11
SM-66	6.6	11.0	..	..
V-4	4.3	8.6	40	4
V-5	5.2	10.2	40	6
V-7	7.0	13.0	84	11

The Flatop models have all-steel cabinet construction, automatic interior cabinet light, and hardware of the semi-concealed type.

Model V-4 has aluminum ice trays with rubber cube divider, glass defrosting dish, vegetable pan, ice tray remover, three full shelves and one small shelf of the bar type with flat wires.

Model V-5 has this equipment, and in addition, a foot pedal door opener, and a water bottle.

The largest Flatop model, the V-7, has all the features of the V-5 plus the following: one all-rubber ice tray, set of glass food containers, one full shelf offset in center to accommodate chiller tray, one sliding shelf, white porcelain pan that forms top of large vegetable drawer.

### Kitchen Plan Book Being Prepared

NEW YORK CITY—To assist in the promotion of the National Kitchen Modernizing activity which it is sponsoring jointly with the Edison Electric Institute, National Electrical Manufacturers Association is preparing a Program Plan Book, which will contain suggestions and information for the use of utilities, retailers, and contractors tying in with the activity.

Only manufacturers contributing to the program will be listed in the book. Copies will be sent to approximately 600 participating utilities, to all participating manufacturers, and to retailers and contractors.

Most details incident to launching the program have been completed, and it is expected that the book will be ready in two weeks. Descriptive material and pledges have been sent to Nema members to whom the program is expected to prove most beneficial.

The material includes a special pamphlet prepared by Nema, showing the far-reaching effect which the modernizing activity is expected to have among its own membership. Major part of the \$52,000 advertising budget, Nema's share, is being provided by member manufacturers of household refrigerators, ranges, and water heaters.

"Other interested sections" who will benefit indirectly from the modernizing activity are being requested to contribute to the program's financing in proportion to the benefits which they may reasonably expect from it.

It is pointed out, however, that the schedule is intended simply as a guide to the member in determining his financial participation in the program. Members are expected to contribute to the activity only in the proportion to which they anticipate it will benefit their net sales.

The kitchen modernizing activity is Nema's first major undertaking under its business development program, inaugurated at the 1935 spring meeting of the association.

### Dividend Paid Holders Of Majestic Bonds

CHICAGO—Creditors of Grigsby-Grunow Co. holding first mortgage convertible 6 per cent bonds last week received from Trustee Frank H. McKee a second dividend, equivalent to 15 per cent of the par value of the bonds. The dividend was authorized by Referee Wallace Streeter on Dec. 3.

Substantial progress has been made in liquidating the assets of the estate. Sales of machinery and equipment totaling more than \$1,000,000 have been made, reports James H. Carr of Allegheny Steel Co., chairman of the bondholders' committee. However, a large amount of equipment, as well as

A revised catalog of equipment still on hand has been sent to creditors, suggesting they bring it to the attention of persons interested in purchasing property listed.

## Program Completed for Annual A.S.H.V.E. Convention in Chicago Jan. 27-30

(Concluded from Page 1, Column 2) heat transfer through finned surfaces, and desirable air quantities.

Coincident with the convention will be the Fourth International Heating, Ventilating and Air Conditioning Exposition, which will be held at the International Amphitheater, 42nd and Halsted Sts.

More than 200 firms will exhibit the newest developments in the air-conditioning field at the exposition.

The mid-winter meeting of the National Warm Air Heating and Air Conditioning Association will be held at the Stevens hotel, Jan. 28-30, and a joint session has been planned for members of the Association and the A.S.H.V.E.

Outstanding social event of the meeting will be the annual banquet Wednesday night, Jan. 29. Major John L. Griffiths will be the speaker. Following is the complete program:

#### Jan. 27 (Monday)

9:30 a. m.—Registration—ball room foyer.

10:00 a. m.—Business meeting—Red Lacquer room.

Greetings—President John Howatt. Reports of officers.

Reports of Council committees: Committee on Research: Prof. A. P. Kratz, chairman.

Guide Publication Committee: Prof. G. L. Larson, chairman.

Committee on Ventilation Standards: W. H. Driscoll, chairman.

Committee on Constitution and By-Laws: W. T. Jones, chairman.

Report of tellers of election.

2:00 p. m.—Opening of the Fourth International Heating and Ventilating Exposition—International Amphitheater, 42nd and Halsted Sts.

3:00 p. m.—Meeting of the council.

#### Jan. 28 (Tuesday)

9:30 a. m.—Technical session—Red Lacquer room.

"Study of the Conductivity of Concrete"—F. B. Rowley.

"Comparative Studies of Combustion Results with Various Thermostats"—B. F. Shaw.

"Saving Affected by Storm Sash"—A. P. Kratz and S. Konzo.

12:30 p. m.—Get-Acquainted Luncheon (members, guests, and ladies).

2:30 p. m.—Meeting of committee on research.

2:30 p. m.—Meeting of chapter officers.

4:00 p. m.—Organization meeting of nominating committee.

10:00 p. m. to 1:00 a. m.—House warming party.

#### Jan. 29 (Wednesday)

9:30 a. m.—Technical session—Red Lacquer room.

"Heat Transfer through Finned Tubing"—G. L. Tuve.

"Subjective Reactions of Human Beings to Certain Outdoor Atmospheric Conditions"—C. E. A. Winslow and L. P. Herrington.

"Minimum Ventilation Requirements from the Standpoint of Body Odor"—C. P. Yaglou.

"Airfoil Fan Characteristics"—W. A. Rowe.

2:00 p. m.—Warm Air Heating & Cooling Session with National Warm Air Heating and Air Conditioning Association at Stevens hotel.

"Room Surface Temperature of Glass Windows"—J. E. Emswiler and W. C. Randall.

7:30 p. m.—Annual Banquet and Dance—O. J. Prentice, toastmaster; Maj. John L. Griffiths, speaker; presentation of F. Paul Anderson Medal and Past Presidents emblem.

#### Jan. 30 (Thursday)

9:30 a. m.—Technical session—Red Lacquer room.

"Comfort Standards for Summer Air Conditioning"—F. C. Houghten and Carl Gutberlet.

"Corrosion Studies in Steam Heating Systems"—R. R. Seeber, F. A. Rohrman, and G. E. Smedberg.

### List of Exhibitors

A partial list of exhibitors, Fourth International Heating and Ventilating Exposition, is as follows:

Aerofin Corp.; The Aerologist; Air Controls, Inc.; Div. of Cleveland Heater Co.; Airtherm Mfg. Co.; Alco Valve Co., Inc.; Allis-Chalmers Mfg. Co.; American Artisan; American Blower Corp.; American Brass Co.; American Gas Products Corp.; American Radiator Co.; American Rolling Mill Co.; American Society of Heating and Ventilating Engineers.

American Sheet & Tin Plate Co.; American Steel & Wire Co.; Anderson Mfg. Co.; Armstrong Bros. Tool Co.; Armstrong Cork Products Co.; Armstrong Machine Works; Automatic Burner Corp.; Automatic Heat & Air Conditioning; Automatic Products Co.; Automatic Reclosing Circuit Breaker Co.; Autovent Fan & Blower Co.

Baker Ice Machine Co.; Baldor Electric Co.; Barber-Colman Co.; Barnes & Jones, Inc.; Beaver Pipe Tools, Inc.; Bell & Gossett Co.; Bethlehem Steel Corp.; Breuer Electric Mfg. Co.; Brown Instrument Co.; Bryant Heater Co.

Buckeye Blower Co.; Buffalo Forge Co.; Burdett Mfg. Co.; Burge Ice Machine Co.; Burgess Battery Co. (Acoustic Div.); Burke Stoker & Mfg. Co.; Burnham Boiler Corp.

Carbondale Machine Corp.; Carnegie-

Illinois Corp.; Carrier Corp.; Carter Coal Co.; Century Electric Co.; Century Engineering Corp.; W. M. Chace Valve Co.; Chapman Clay Co.; Chase Brass & Copper Co.; Chicago Board of Health.

Chicago Pump Co.; Columbia Steel Co.; Cook Electric Co.; Crane Co.; Cyclone Fence Co.; Dall Steel Products Co.; Dayton Rubber Mfg. Co.; Delco Appliance Corp.; Department of Smoke Inspection and Abatement.

Detroit Lubricator Co.; Dole Valve Co.; Domestic Engineering; Domestic Engineering Co.; C. A. Dunham Co.; Eagle Picher Sales Co.; Economy Pumping Machinery Co.; Electric Air Heater Co.; Div. of American Foundry Equipment Co.; Electromatic Corp.; Electrol, Inc.; Ellison Draft Gage Co.

Emerson Electric Mfg. Co.; George Evans Corp.; Excelsior Products Corp.; Fairbanks Morse & Co.; Fedders Mfg. Co., Inc.; Fee & Stemwedel, Inc.; Fitzgibbons Boiler Co., Inc.; Fox Furnace Co.; Julien P. Friez & Sons, Inc.; Frigidaire Corp.; Fuel Oil Journal; Furblo Co.

Garden City Fan Co.; Garwood Industries, Inc.; General Electric Co.; Gilbert & Barker Mfg. Co.; Grinnell Co., Inc.; Hart & Cooley Mfg. Co.; Heating Journals, Inc.

Heating, Piping & Air Conditioning; Heating & Ventilating; Hexcel Radiator Co.; Himelblau, Blyfield & Co.; Hoffman Specialty Co., Inc.; Holtzer-Cabot Electric Co.; Hotstream Heater Co.; Howe Ice Machine Co.; Heil Co.

Ilg Electric Ventilating Co.; Illinois Engineering Co.; Illinois Testing Laboratories, Inc.; Imperial Brass Mfg. Co.; Independent Register & Mfg. Co.; Industrial Press; Ingersoll-Rand Co.; Iron Fireman Mfg. Co.

Jenkins Bros.; Johanson Water Heater Co.; Johns-Manville; S. T. Johnson Co.; Johnson Service Co.; Jones & Laughlin Steel Corp.; Kainer & Co.; Keasbey & Mattison Co.; Keeney Publishing Co.

John G. Kelly, Inc.; Kelvinator Corp.; Kewanee Boiler Corp.; Klean-Heat, Inc.; Korfund Co.; Lamneck Products, Inc.; Lau Heating Service, Inc.; Lennox Furnace Co.

McCord Radiator & Mfg. Co.; McDonnell & Miller; Maid-O-Mist, Inc.; Jas. P. Marsh Corp.; May Oil Burner Corp.; Mercoid Corp.; Meyer Furnace Co.; Midwest Piping & Supply Co.; Milwaukee Valve Co.; Minneapolis-Honeywell Regulator Co.; Modine Mfg. Co.; Motor Wheel Corp.; Mueller Brass Co.; L. J. Mueller Furnace Co.; National Regulator Co.

National Sheet Metal Contractor; National Tube Co.; Herman Nelson Corp.; John J. Nesbitt, Inc.; Oil Heat; Owens-Illinois Glass Co.; Peerless Electric Co.

Penn Electric Switch Co.; Peoples Oil Burner Co.; Perflex Radiator Co.; Petro-meter Corp.; Plibrico Jointless Firebrick Co.; Plumbing & Heating Trade Journal; Powers Regulator Co.; Practical Instrument Co.; Petroleum Heat & Power Co.; Refrigeration & Air Conditioning Institute; Republic Steel Corp.

Richardson & Boynton Co.; Ric-wil Co.; Ridge Tool Co.; Rochester Mfg. Co.; Russell Electric Co.; Rega Mfg. Co.; Sangamo Electric Co.; Sarco Co.; Scott-Newcomb, Inc.

Scully Steel Products Co.; Silent Glow Oil Burner Corp.; Steel & Tubes, Inc.; Sterling Engineering Co.; Stevens-Root Co.; Streamline Pipe & Fittings Co.; B. F. Sturtevant Co.; Surface Combustion Corp.; Taco Heaters, Inc.; Tennessee Coal, Iron & R. R. Co.; H. A. Thrush & Co.; Timken Silent Automatic Co.

H. O. Trierce Co.; Turney Corp.; Tuttle & Bailey, Inc.; Uni-Flo Corp.; United States Radiator Corp.; United States Register Co.; United States Steel Corp. Subsidiaries; Viking Pump Co.; Waterfilm Boilers, Inc.; Waterloo Register Co.

Waterman-Waterbury Co.; Watts Regulator Co.; Wayne Oil Burner Corp.; Webster Electric Co.; Warren Webster & Co.; Weil-McLain Co.; Weil Pump Co.; Westinghouse Electric & Mfg. Co.; Westinghouse Electric & Mfg. Co. Air Conditioning Department.

Whiting Corp.; Wilson & Co., Inc.; Williams Oil-O-Matic Heating Corp.; Wood Conversion Co.; Worthington Pump Machinery Corp.; York Ice Machinery Corp.; York Oil Burner Co., Inc.; Young Radiator Co.; Youngstown Sheet & Tube Co.

"AN OLD NAME IN A YOUNG INDUSTRY"

# CURTIS

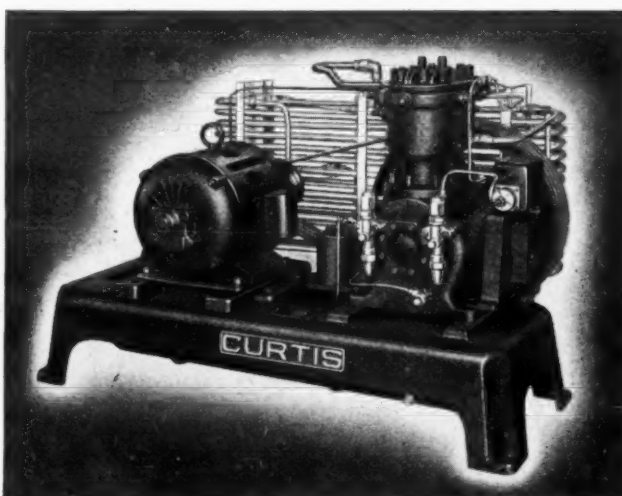
Specify CURTIS  
and be sure

## ELECTRIC REFRIGERATION AND AIR-CONDITIONING UNITS

The sure way to satisfaction from a refrigeration or air-conditioning installation is to be certain that its most vital part—the condensing unit—is built by Curtis. Their constant, trouble-free performance is the result of 41 years' specialized experience in building fine compressors.

**Complete Line—59 Units • Extra Capacity • Slow Operating Speed • Experienced Design • Low Upkeep • Rugged Construction • Fine Materials and Workmanship**

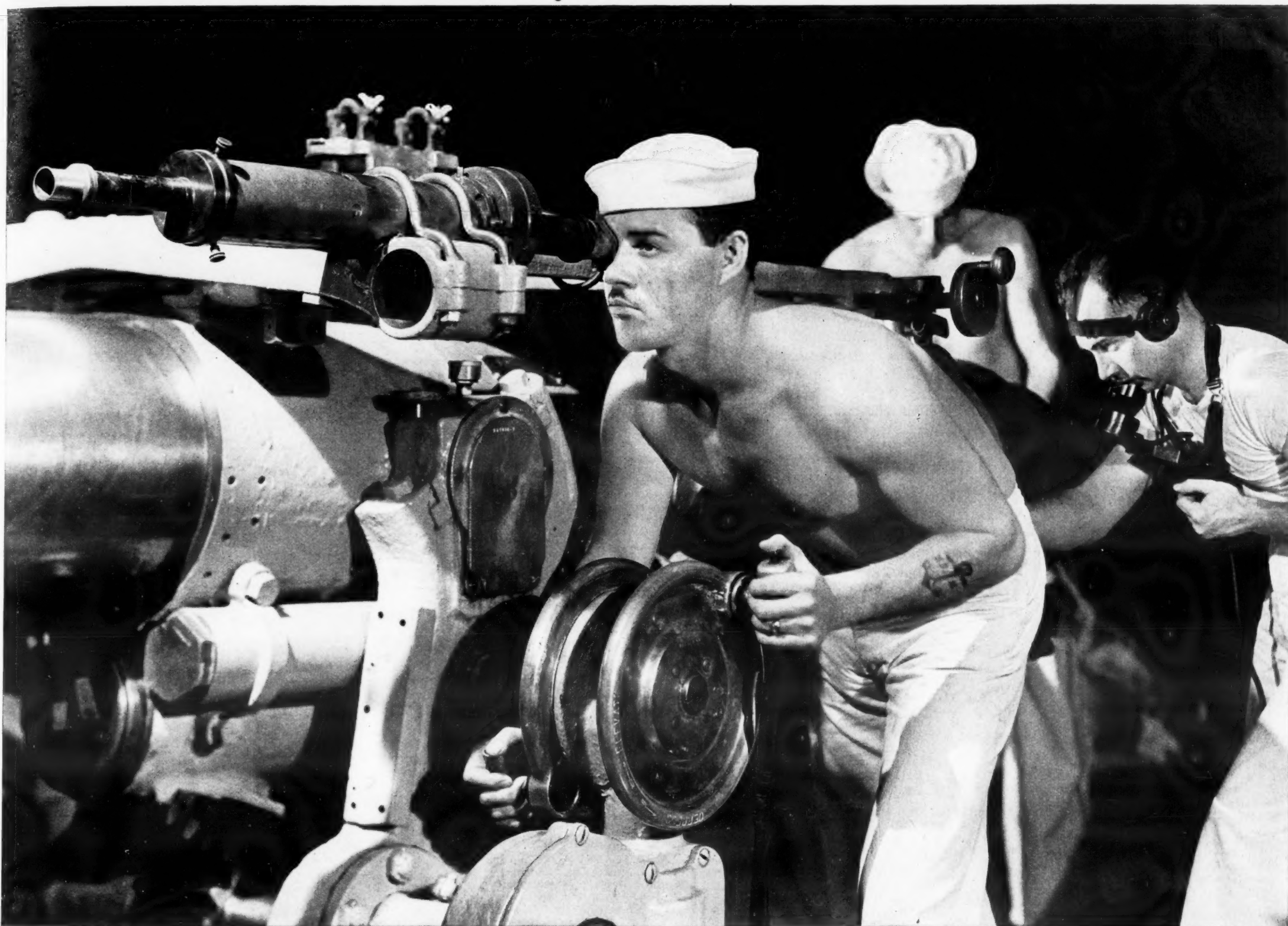
Curtis enjoys the highest capital and credit rating—a Curtis product won't become an "orphan".



# CURTIS

Curtis Refrigerating Machine Company  
Division of Curtis Manufacturing Co.  
1912 Kienlen Avenue — St. Louis, Mo.





# CLEARED FOR ACTION!

**OBSTACLES ARE GONE! FRIGIDAIRE  
HAS SET UP A CLEAR ROAD  
TO SUCCESSFUL SELLING IN 1936**



• THE way is cleared. Frigidaire is on the move! Never before has there been such feverish activity because never before has there been the powerful plan that is to carry Frigidaire to record heights in 1936. . . . New methods—dynamic, forceful, sure-fire ways to get business. . . . A new product astonishing beyond every hope, new enthusiasm stimulated by the sensational nature of the 1936 selling program. It's a program that only Frigidaire could sponsor . . . and only Frigidaire can fully take advantage of the enormous possibilities that will be opened by this spectacular selling plan . . . There are indications of the greatest, record-breaking year in Frigidaire history and Frigidaire is cleared for action! FRIGIDAIRE CORPORATION, DAYTON, OHIO.

*You'll do better with Frigidaire in 1936!*



## Sales Idea of the Week

By V. E. (Sam) Vining, Director of Department Store Sales, Westinghouse Electric & Mfg. Co.

What do you mean "Nobody wants to buy anything?"

I have been hearing that line of "bunk" for years. And as a young salesman I was taught that I must go out to battle like a cross between Don Quixote and the Maid of Orleans, girded to do or die in the fight against a supposed "Consumer Resistance"—based on the idea that "Nobody wants to buy nothin'."

Hooley.

At the moment I can't think of anything I don't want to buy—unless it's a haircut because I just had one—and neither can you—except things you already possess.

Buying is one of the world's best beloved sensations. Even buying a pencil from a blind beggar gives us a glow.

Our problem with the prospect is not "to make him buy"—it is to get him to relax and "let himself buy"—or "find an excuse to buy." And we will get farther in selling if we remember it.

The amateur tries to sell the customer—the real salesman helps the customer sell himself, merely directing the channel of thought. The young salesman is proud of his gift of gab and talks the prospect to death. The older, more experienced salesman knows the importance of being a good listener.

## Absorption Unit Is Used in Williams' Air Conditioner

(Concluded from Page 1, Column 1)

toxicity hazards, compactness, and adaptation to a year-round air-conditioning system operating under automatic control.

Zeon is the refrigerant and Zeosolve the solvent used. These chemicals are said to be essentially non-toxic, non-irritant, non-corrosive, non-inflammable, chemically stable, chemically inert, and to have a low specific heat with a high coefficient of heat conductivity.

A newly-developed direct-connected pump is used for the purpose of circulating the solution from the absorber through the heat exchanger to the heater. There are no metal-to-metal moving parts in the pump except the seal faces of a double seal. This seal is submerged in a bath of oil.

Williams engineers assert that on the basis of their capacities the Air-O-Matic refrigeration units are small and compact, the 20-ton unit being 44 in. wide, 48 in. long, and 70 in. high, and the 6-ton unit 44 in. wide, 44 in. long, and 55 in. high.

Operating conditions which are taken as a basis for rating the capacities and efficiencies of the refrigeration unit are as follows: a saturated refrigerant temperature in the cooling coil of 40° F., a steam temperature in the heating coil of 240° F. (10-11 lbs. pressure), an inlet cooling water temperature of 85° F., and outlet cooling water temperature of 95° F.

Under these standard operating conditions the high side pressure is 28 lbs. and the low side pressure 4½ in. vacuum; steam requirements are 19 lbs. of steam per hour per ton, the power requirements are 100 watt hours per hour per ton, rate of circulation of solution from the absorber to the heater is one g.p.m. per ton, the rate of flow of cooling water through the unit is 5.7 g.p.m. per ton, and the heat dissipated from the machine is 480 B.t.u.'s per minute per ton.

The range of normal operating conditions may be considered to be as follows: a saturated refrigerant temperature in the cooling coil of 35° F. to 45° F. (7½ to 2 in. vacuum), a steam temperature in the heating coil of 230° F. to 250° F. (6 to 15 lbs. pressure), inlet cooling water temperature of 70° F. to 90° F., and an outlet

cooling water temperature of 90° F. to 100° F. (head pressure 28 lbs. to 33 lbs.).

Within this range of operating conditions, the change in capacity with a change in operating conditions may be indicated roughly as follows: an increase in saturated refrigerant temperature in the cooling coil increases the capacity of the machine 2.4 per cent per degree; an increase in the steam temperature increases the capacity of the machine 1 per cent per degree; a decrease in the mean temperature of the cooling water increases the capacity 2.4 per cent per degree.

Within this range of operating conditions, the steam requirements vary from 18½ to 19½ lbs. of steam per hour per ton; the heat dissipated from the unit varies from 470 to 490 B.t.u.'s per minute per ton; the power input varies from 65 to 150 watt hours per hour per ton. The operating conditions which give the higher capacities also give the higher efficiencies.

The complete Air-O-Matic air-conditioning system consists of the absorption refrigeration machine, air-distribution unit, boiler-burner unit, water-cooling equipment, and control system.

The Air-O-Matic absorption refrigeration units are now offered in sizes 6-, 9-, 14-, and 20-ton capacities. They require ¾-, 1-, 1½-, and 2-hp. motors respectively.

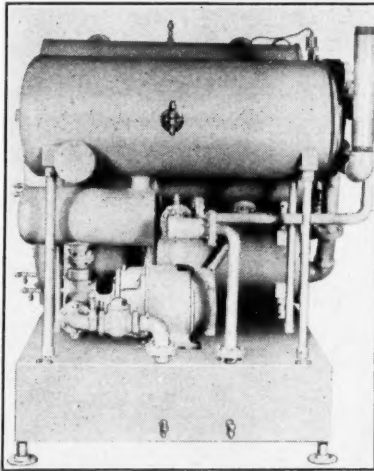
The air-distribution unit consists of a cooling coil, indirect steam-heating coil, humidifier, blower, and filters. The cooling coils are tin-dipped copper-finned coils and are unusually deep to insure ample dehumidification. The heating coils are tin-dipped copper-finned coils. The humidifier is of the pan type, located above the heating coil and equipped with an automatic water feed. There is also offered a spray type of humidifier operated under control of a humidistat.

The blower is the single inlet type with the drive and motor outside the air current but within the housing. The filters are of the conventional type.

Oil-O-Matic burners ranging in capacity from 1½ to 25 gallons of oil per hour are offered to meet the burner requirements for any Air-O-Matic installation. Boiler-burner units with capacities up to 2 gallons of oil per hour are offered to meet the requirements of the domestic and small commercial installations. Where desirable a gas or coal fired boiler may be used.

A spray pond or wind tower of con-

## For Air Conditioning



New type absorption unit (this model has 14 tons capacity) for use in Air-O-Matic systems.

ventional design is used where provision for water cooling is necessary. Where the cost of tap water is sufficiently low to warrant its use, an automatically controlled water valve is used to regulate the flow of the cooling water through the absorption refrigeration machine.

The standard control system of Air-O-Matic consists of a selector switch, dual heating thermostat, cooling thermostat, motor-operated steam valve, damper controller and the necessary relays. The selector switch has a dial with four positions: "cooling," "ventilation," "heating," and "off."

When the dial of the selector switch is set to the "cooling" position, the motor-operated steam valve to the heating coil is closed, the blower in the air distribution unit is placed in operation and the circuit is closed to the cooling thermostat. The room temperature is then controlled by intermittent operation of the absorption refrigeration unit under the control of the cooling thermostat. The circulation of the cooling water through the absorption refrigeration unit functions automatically in conjunction with the operation of this unit.

When the dial of the selector switch is set to the "ventilation" position, the circuits to both the "heating" and "cooling" thermostats are opened. The motor-operated steam valve to the heating coil is closed, and the blower operates continuously to provide air circulation and ventilation.

When the selector switch is set to the "heating" position, the motor-operated steam valve to the heating coil is opened, and the circuit to the dual heating thermostat is closed. The dual heating thermostat is two independent thermostats, with a toggle switch which closes the circuit to one thermostat and opens the circuit to the other. When the toggle switch is in the "night" position, the "night" thermostat circuit is closed. This thermostat then controls the room temperature by the intermittent operation of the blower.

When the toggle switch is set in the "day" position, the circuit of the "day" thermostat is closed. This thermostat then controls the room temperature by regulating the position of the face and by-pass dampers on the heating coils, and the blower operates continuously to provide air circulation and ventilation.

In installations where the person load is light and it is not necessary to provide continuous forced air circulation and ventilation, satisfactory results are obtained without the use of the "day" thermostat with its damper controller and damper, Williams engineers declare.

When the selector switch is set to the "off" position, the circuits to the thermostats and blower are opened.

A pressure control on the boiler governs operation of the burner.

## 53,035 Refrigerators Sold by 14 Nema Companies

The following 14 member companies of the Refrigeration Division of the National Electrical Manufacturers Association (Nema) reported household refrigerator sales for November, 1935: Apex Electrical Mfg. Co., Crosley Radio Corp., Frigidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Servel, Inc. (export only), Stewart-Warner Corp., Sunbeam Electric Mfg. Co., Uniflow Mfg.

Co., Universal Cooler Corp., and Westinghouse Electric & Mfg. Co. Member companies not reporting included: Jomoco, Inc., Merchant & Evans Co., and Sparks-Withington Co.

The sales of the reporting companies do, however, include units manufactured for the following concerns: Major Appliance Corp., Montgomery Ward & Co., Potter Refrigerator Corp., Sears, Roebuck & Co., and Truscon Steel Co.

		SALES FOR NOVEMBER, 1935		1935	
		Domestic	Canadian	Other	Foreign
		Quantity	Value	Quantity	Value
<b>Lacquer (Exterior) Cabinets Complete</b>					
1. Chest	179	\$ 8,631	2	\$ 95	\$ 15,421
2. Less than 3 cu. ft.	109	6,464	.....	.....	460
3. 3 to 3.99 cu. ft.	1,404	85,257	33	1,872	39,187
4. 4 to 4.99 cu. ft.	6,367	416,911	361	26,964	236,816
5. 5 to 5.99 cu. ft.	6,528	509,845	42	3,389	117,521
6. 6 to 6.99 cu. ft.	6,224	583,202	186	17,727	66,948
7. 7 to 7.99 cu. ft.	5,786	620,327	83	9,233	35,142
8. 8 to 9.99 cu. ft.	957	111,529	8	876	6,592
9. 10 to 12.99 cu. ft.	26	5,451	.....	.....	.....
10. 13 cu. ft. and up	4	1,279	.....	.....	.....
<b>11. Total Lacquer</b>	<b>27,584</b>	<b>2,348,806</b>	<b>715</b>	<b>60,156</b>	<b>518,087</b>
<b>Porcelain (Exterior) Cabinets Complete</b>					
12. Up to 4.99 cu. ft.	377	29,008	11	429	7,842
13. 5 to 5.99 cu. ft.	1,588	140,399	5	419	34,783
14. 6 to 6.99 cu. ft.	3,338	401,611	2	303	11,593
15. 7 to 7.99 cu. ft.	2,287	283,808	1	117	16,531
16. 8 to 9.99 cu. ft.	1,212	173,385	3	386	9,206
17. 10 to 12.99 cu. ft.	273	50,268	1	196	6,408
18. 13 cu. ft. and up	166	39,748	.....	.....	1,796
<b>19. Total Porcelain</b>	<b>9,741</b>	<b>1,118,224</b>	<b>23</b>	<b>1,850</b>	<b>88,159</b>
<b>20. Total Lines 11 and 19</b>	<b>37,325</b>	<b>3,467,030</b>	<b>738</b>	<b>62,006</b>	<b>606,246</b>
<b>Separate Systems</b>					
21. ¼ Hp. or Less	5,129	209,060	.....	1,031	46,270
<b>Separate Household Evaporators</b>					
22. 252	4,020	11	191	427	7,639
<b>23. Total Lines 20, 21, 22</b>	<b>42,706</b>	<b>.....</b>	<b>749</b>	<b>.....</b>	<b>9,580</b>
<b>Condensing Units</b>					
24. ¼ Hp. or Less	253	13,391	6	343	945
25. Cabinets—No Systems	370	15,011	.....	120	55,142
<b>26. Total Household</b>	<b>.....</b>	<b>\$3,708,512</b>	<b>.....</b>	<b>\$62,540</b>	<b>\$720,541</b>

## 5,298 Refrigerating Machines Sold in October by 19 Manufacturers

Commercial sales for November, 1935, were reported to the National Electrical Manufacturers Association (Nema) by 19 companies, some of which are not members of the association. These reports cover the sale of units less than 1 hp. in size. Companies reporting are: Baker Ice Machine Co., Brunner Mfg. Co., Carbon-dale Machine Corp., Carrier Engineering Corp., Crosley Radio Corp., Frigidaire

Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigerator Co., Merchant & Evans Co., Norge Corp., Phoenix Ice Machine Co., Reliance Refrigerating Machine Co., Servel, Inc., Uniflow Mfg. Co., Universal Cooler Corp., Westinghouse Electric & Mfg. Co., and York Ice Machinery Corp.

		SALES FOR NOVEMBER, 1935		1935	
		Domestic	Canadian	Other	Foreign
		Quantity	Value	Quantity	Value
<b>COMMERCIAL</b>					
1. Water Coolers Complete	436	\$ 45,632	10	\$1,254	\$ 7,274
2. Water Coolers Remote	36	1,937	.....	.....	476
3. Ice Cream Cabinets Complete	146	18,316	.....	.....	3,991
4. Ice Cream Cabinets Remote	109	15,293	.....	14	2,353
5. Beverage Coolers Comp.	300	24,338	2	152	1,084
6. Beverage Coolers Remote	63	4,829	.....	3	198
<b>Condensing Units</b>					
7. Less than ¼ Hp.	439	21,906	4	257	8,789
8. ¼ to ½ Hp.	1,431	116,853	23	2,148	61,711
9. Above ½ and Less Than 1 Hp.	411	51,753	6	825	20,999
<b>10. Total Lines 7, 8, and 9</b>	<b>2,281</b>	<b>.....</b>	<b>33</b>	<b>.....</b>	<b>973</b>
<b>11. Total Lines 1, 3, 5, 10</b>	<b>3,163</b>	<b>.....</b>	<b>45</b>	<b>.....</b>	<b>1,090</b>
12. Evaporators	2,164	62,196	69	2,641	19,967
13. Miscellaneous Cases and Cabinets	36	7,528	.....	7	1,801
<b>14. Total Commercial</b>	<b>.....</b>	<b>\$370,581</b>	<b>.....</b>	<b>\$7,277</b>	<b>\$128,643</b>

## November Sales Establish Record for Month

(Concluded from Page 1, Column 4) tion with the advent of cold weather. Instead, they are sticking to their sales posts for the whole 12 months of the year, with the result that the dips that usually hit the sales charts around Sept. 1 are gradually fading out of the picture.

The November sales total sent cumulative figures for the first 11 months of the year to a mark 328,469 higher than the 1,314,800 total for the same period of 1934, and 252,669 higher than the 1,390,600 which the industry sold in the whole of last year.

The 1934 mark, a new high in the industry's history, was broken during

the first eight months of 1935, when sales hit 1,465,700 units. Succeeding months' marks have buried the old record deeper and deeper.

World shipments of household electric refrigerators during November, as reported by 14 member companies of National Electrical Manufacturers Association, set a new high record of 53,035 for the month, and went 1,447 past the October Nema mark, 51,588 units.

For the 11 months of 1935, Nema companies have sold 1,496,680 units, 301,393 more than the total of 1,195,287 reported sold during the same period of 1934. In fact, Nema's 11-months mark is 232,459 better than its total for the whole of 1934, when sales by member companies reached 1,264,221 units.

## Stewart-Warner Distributors and Executives Swap Experiences at Conclave



"Sav-A-Step," feature of the refrigerator line for 1936, was the principal topic of discussion at Stewart-Warner's distributor convention in Chicago recently. (1) Oliver Shaw, Charlotte, N. C.; G. R. Wood, H. W. Alexander, Hartford, and W. Jutras, Providence, listen as it is explained. (2) Board Chairman J. W. Knowlton and President J. E. Otis watch distributors' reaction to it. (3) Its merits are discussed during a recess, by G. A. Dixon, Norfolk; R. S. Brunhouse of S-W; W. R. Cantrell, and W. E. Muir, Des Moines. (4) Two Kansas City distributors, R. A. Hahn and P. B. Richmond, greet it eagerly. (5) F. M. Cole, Monroe, Mich.; W. N. Brandon, Little Rock; and A. Johnson, S-W, hear Lee Milligan of Detroit tell what it will mean to his sales this year.



## Comment

By F. M. Cockrell

### Go West, Young Man

"Go west, young man, go west," was the advice of Horace Greeley to the young men of his time. Next week, George Taubeneck, editor of the News, will start on a journey in that direction.

No doubt Horace Greeley meant that when the young man got west, he should stay there. But George's plan is to keep on going until he gets back where he started.

When anyone starts "going around in a circle," it usually means that he is not getting anywhere.

George intends to go around a pretty big circle and his past performance is ample assurance that he will absorb much valuable information during his travels.

### The Wanderlust

Five years ago, when George joined the staff of the News, immediately after his graduation from the University of Illinois, he told me something about his hopes and ambitions.

For one thing, he wanted to go to Europe. He had an idea that he should try to make the trip before he became enmeshed in a job.

He had observed that most people who have longings to travel are thwarted in that ambition.

Usually, a self-supporting young man must get a good job and stick to it for a long time in order to save enough money to satisfy his desire to travel.

But it usually happens that by the time a man has worked his way up to a good paying job he has also accumulated a great many local interests and responsibilities which tend to keep him where he is.

### Our Five Year Plan

But there is an answer to that problem, and I proposed it to George at the time.

"Get a job which requires travel," I suggested. "For example, join the staff of the News as a reporter and then when you go some place, you will be going to see somebody. You can see the scenery en route."

Expanding on the theory, I pointed out the advantages of such a program when it came to traveling in foreign countries.

"When a tourist goes to Europe, his sight-seeing is largely limited to the outside. He may see many historic points and possibly a few important people, but he has little or no opportunity to learn what is going on inside.

George conceded the advantages of such a program and while he may have had his doubts as to how it would prove out, he went to work in earnest as a News reporter.

### A Gentleman, a Scholar and a Salesman



John H. Mitchell, 17 Ellison Ave., Bronxville, N. Y., inventor of the Mitchell Fin Humidifier, visited the News offices recently. While in the editor's office he became intrigued by the title of a book. Since reading a book is something which Mr. Mitchell does easily and quickly, he soon found a comfortable position in the reception room and proceeded to absorb the contents of "Straight Thinking" by William J. Reilly.

Many years ago Mr. Mitchell operated a book store in Norfolk, Va. In order to sell books, he read them. If what he read was good, he retained it. His ability to render verbatim quotations from the wit and wisdom of the ages makes him a most delightful conversationalist and a most convincing salesman. When John Mitchell wants to sell something, he can instantly summon a dozen philosophers, prophets, or poets to help him prove his point.

For seven years, when I lived in Bronxville, he was my next-door neighbor and of all the good neighbors I have ever known he was the most interesting.

### See America First

During the past five years, he has followed another good precept, namely: "See America first." At least he has pretty thoroughly covered the eastern half of the United States with side trips as far as Bermuda and Cuba.

During January he will travel west in his yellow Auburn speedster to see a lot of places and meet some people that he has missed in his previous jaunts around the country.

### Romance and Adventure

Then he will start across the Pacific on a journey through southern seas.

Hawaii, Fiji Islands, New Zealand, Australia, Java, Singapore, Penang, Rangoon, Calcutta, Bombay, Arabia, Egypt. Now there is a trip worth while!

If I had the choice, I would rather see those intriguing lands and peoples than all of the capitals of Europe.

But George will see the capitals of Europe too, if all goes well.

### Friends in Every Port

But the most advantageous feature of his itinerary is that he will meet friends and business acquaintances at every port of call.

Wherever he goes, around the world, there will be important people to see who know him, or know about him, and who have already expressed a desire to see him and talk with him.

As editor of the News, of course, he has serious work to do. He will be extremely busy getting information and writing articles for the paper. But he likes to write, as well as to travel, and he has learned how to do both efficiently and profitably.

### And Expenses Paid

Thus it has worked out, after five years of strenuous application to the job, that he now has an opportunity to fulfill his youthful ambition. Furthermore, he is making the trip with a plan and a purpose, and with his expenses paid.

Is it necessary to point out the moral of this story to the ambitious and adventurous young man who is trying to decide how to get ahead in the world and have a good time doing it?

By the way, we need another good reporter on the News.

### Social Security Taxes

More taxes to pay, more reports to the Government and more work for the bookkeeper are new burdens on business effective today (January 1, 1936) because of the Federal Social Security Act which became U. S. law Aug. 14, 1935.

So start keeping a record today of all payments made to employees, whether salaries, wages, commissions, or other form of compensation for service and be prepared to pay one per cent of the total amount as a tax to the Federal Government.

Next year (1937) the rate will be two per cent and in 1938 and thereafter the rate will be three per cent. This is the tax for unemployment insurance purposes.

### Old Age Benefits

Beginning in 1937 another tax will be added for old age benefit purposes. During 1937, 1938, and 1939 the rate will be one per cent. During the next three years (1940-2) the rate will be 1½ per cent, the next three years (1943-5) the rate will be two per cent, the next three years (1946-8) it will be 2½ per cent and in 1949 and thereafter three per cent.

The first tax (for unemployment insurance) which takes effect today applies to all employers of eight or more employees. The first report must be made to the Government by Jan. 31, 1937. The tax may be paid in full on that date, or it may be paid in quarterly instalments on Jan. 31, April 30, July 31, and Oct. 31.

In the event that your state laws provide for unemployment insurance, a credit will be allowed up to 90 per cent of the Federal assessment. But if your state has no such unemployment insurance law, then the Federal Government will collect the full tax.

### Eight Employees

If you have eight or more employees, remember that you must pay the tax on every person employed by you during the calendar year even if some

of the employees were engaged for only a day, or even an hour.

You are an "employer" according to the law if you employ eight or more persons for one day or more in 20 different weeks during the year and in that case you must pay a tax on all wages paid to all employees.

So even if you do not have eight employees now, but may have that many later on, it will be advisable to have your payroll records complete.

No tax will be collectable on wages paid in January, 1936, where such wages have been earned during the previous year. Any form of compensation for services is taxable whether paid in cash or otherwise, such as room and board.

Care should be taken to keep a record of expenses paid to salesmen so that such amounts will not be taxable as "wages."

Next year, when the old age benefit payroll taxes become effective, all employers will be taxed regardless of the number of employees. But let's not worry about that now. Sufficient unto the day is the evil thereof.

### 'Unconstitutional'

We are informed on good authority that the Federal statute is "undoubtedly unconstitutional" since the Su-

preme Court has repeatedly held voidable a statute enacting taxes which are not for revenue to support the government.

The real purpose of the act, it appears, is to force the states to enact unemployment benefit laws after the Federal pattern.

Therefore, of course, all foresighted employers will protest the tax so as to permit recovery later.

### More Holiday Greetings

Added to the list in last week's issue:

From Servel, Inc., Evansville, Ind., a folder signed by Harry Newcomb, W. J. Aulsebrook, C. L. Olin, P. B. Reed, H. T. Kessler, E. A. Terhune, W. L. Cissell, M. I. Benson, A. M. Schmitz.

Best wishes for the New Year from H. R. Van Deventer, New York City, with the reminder that he was our "first patent attorney advertiser."

A "good-will performance" chart from Barton D. Wood, Inc. of Detroit and Atlanta.

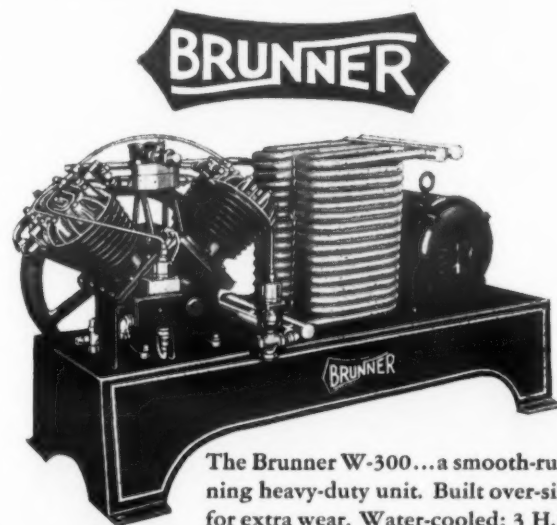
Others who sent greetings were: Bob Petrie, Kelvinator, Detroit. Reuben Ottenheimer, Baltimore, Md. Miller Conditionair, Los Angeles. Commercial Credit Co., Baltimore.

# GOLIATH

## was floored by a detail

GOLIATH, veteran of many a brutal and bloody battle, knew hand-to-hand combat from A to Z. But, like so many great warriors, he grew careless of details—and underrated the fury of a stone-laden sling shot and David's keen eye. ★ ★ ★ Unlike Goliath, Brunner engineers have for thirty years realized this constant threat of underrated details... details of construction which can so easily become the "monkey wrench in the machinery". ★ ★ ★ That's why Brunner Condensing Units and Compressors deliver such rugged service—they are built for it, right down to the smallest detail. Every unit of construction has sound engineering experience back of it. ★ ★ ★ Forty-one Condensing Units and eight Compressor models,

in a range from 1/6 H. P. to 15 H. P. afford a correct capacity Brunner for every type of installation. ★ ★ Brunner Manufacturing Company, Utica, N. Y., U. S. A.



The Brunner W-300... a smooth-running heavy-duty unit. Built over-size for extra wear. Water-cooled; 3 H. P.

SEND FOR YOUR COPY OF THE BRUNNER REFRIGERATOR CATALOG

# BRUNNER

Condensing Units and Compressors



# EXECUTIVES POINT WAY TO DEALER PROFITS IN 1936

## Benefits of FHA Financing Argued by Industry Leaders

### A. E. ALLEN

**'Sales May Exceed 1935 Total by 10%'**

Westinghouse Electric & Mfg. Co.  
200 East Fifth St., Mansfield

We are quite optimistic about the prospects for household refrigerator sales in 1936, and have every reason to believe (based on general business conditions and reports which have been coming in from our dealers and distributors all over the country) that the total sales in 1936 will at least equal those of 1935 and probably exceed them by as much as 10 per cent.

Barring any unforeseen developments in the early part of the year, I think that 1936 should at least see the beginning of a real revival of residential building. There is no question that the stage is set for it with the need that exists, the low finance rates available, and prospects for enhancement in real estate values during the coming years.

The Federal Housing Administration's plan of financing appliance sales has unquestionably been extremely beneficial, and my only regret is that it has not been more widely available or more generally used by dealers and distributors. I am strongly in favor of a continuation of the Act, and feel that more general acceptance of it will come about in 1936. I would like to say a word of caution, however, to all dealers and distributors of these products about the danger of too much high-pressure selling or unsound selling in connection with this plan. Such abuses of the plan will simply result in its ultimate withdrawal, to the detriment of the entire industry.

You have asked me about the needs of the air-conditioning business. I feel that one of the greatest handicaps this young industry has to bear today is the apparent inability of the dealers and contractors who are making the air-

conditioning installations to properly figure their costs of doing business and to secure an adequate mark-up on their costs to enable them to stay in business and make a profit. I think if your publication were to sponsor some sort of uniform method of accounting for air-conditioning dealers whereby an adequate return could be secured on their investment in labor and material, it might have a very wholesome effect on the industry. I think too many people engaged in the air-conditioning business today look upon it as a contracting "bidding" business, and have failed to provide in their organizations and accounting practices provision for constructive business-building effort.

A. E. ALLEN, Vice President.

### G. W. MASON

**'Sale of Two Million Is Reasonable Expectancy'**

Kelvinator Corp.  
Detroit

This replies to your telegram of Dec. 20 asking for my answers to your questions regarding the electric refrigeration industry in 1936.

At the beginning of 1936 I believe the electric refrigeration industry stands at the threshold of the largest consumer demand market that it has ever known. With increased purchasing power throughout the country and a growing confidence that will not be denied, the sale of two million household refrigerators is a reasonable expectancy.

The spending power of the nation is increased and I believe there will result a tremendous building boom in almost every state to meet the house shortage which is developing. It is my opinion that the number of building permits for residential properties in 1936 for the entire United States will be approximately 120,000 this year as compared with only 70,000 last year.

## They Were Asked These Questions:

1. Do you believe that the home market will have sufficient buying power in 1936 to absorb two million household electric refrigerators?
2. Do you believe that conditions are now sufficiently favorable to warrant expectation of large scale residential building activity during 1936?
3. Do you favor continuance of the National Housing Act and the Federal Housing Administration plan of financing refrigerator and other appliance sales?
4. Have you any suggestions regarding a constructive industry educational program which ELECTRIC REFRIGERATION NEWS might promote editorially to help stimulate the sound development of the air-conditioning market?

In certain centers of population, such as Detroit, Washington, Philadelphia, and New York, the increase in residential building will be considerably greater. It is estimated that building permits for homes in those cities this year will be from 300 to 400 per cent higher than in 1935.

Unquestionably the National Housing Act of the Federal Housing Administration Plan of Financing electric refrigerators and other national electrical appliance sales helped to increase the business of many dealers during the past year. Experience has shown that the effectiveness of the plan would be greater if more banks cooperated in handling this type of financing. From a sales standpoint the plan has proven successful for Kelvinator up to the present time and we see no reason why it should not continue to be successful in 1936.

Air conditioning presents another service to the American public which will increase with rapid strides during 1936. From the standpoint of the public and the refrigeration dealer, it would be very helpful if some intensive and intelligent effort were placed behind an educational program designed to educate the public as to what true air conditioning consists of. We think of air conditioning as control of the air both in winter and summer, both as to temperature and humidity conditions. There must be created a realization in the minds of dealers and the public that true air conditioning provides for heating and humidifying the air in the winter and cooling and dehumidifying it in the summer and provides proper circulation and cleanliness of the air at all times.

Although the public is interested vitally in obtaining the same comfort and convenience which air conditioning provides for their homes as they are finding in business places, the 1936 market for air-conditioning installations will remain in the commercial field to a large extent. Number of home owners in air conditioning will increase during the year and may present a sizable market in 1937.

G. W. MASON, President.

### P. B. ZIMMERMAN

**'Improved Buying Power & Lower Rates Will Help'**

General Electric Co.  
Specialty Appliance Department  
Nela Park, Cleveland

This is in reply to your telegram of the 21st.

With the improved purchasing power we are already feeling and which economists tell us should

grow through 1936, the refrigeration industry can well budget 2,000,000 domestic refrigerators for the new year.

The excellent record of performance of most of the refrigerators already installed and the lower and lower cost of electricity will give this business a forward stimulus.

The industry's joint promotion of the complete electric kitchen will also add a new note of buying interest.

The special Federal Housing Administration plan on financing refrigerators is a definite aid in making refrigeration available to low income families. Its continuation will be a great contribution to the industry in realizing its greatest year.

The cooperative endeavors of the building and electrical industries in exhibiting completely equipped New American homes has proven successful for the builder and has given the public a satisfactory demonstration of such new services as air conditioning. More of this work will mean the sale of new homes of modern design and completely equipped. If we will thus raise the standards for the new home, we may expect a great new business in completing the electrical equipment of existing homes.

P. B. ZIMMERMAN.

### H. W. BURRITT

**'Cooperation of More Banks With FHA Needed'**

Leonard Refrigerator Co.  
Detroit

Two million refrigerators in 1936 is easily a possibility for the electric refrigeration industry, in my opinion. All signs point to an extremely large consumer demand in many lines this coming year, and the same consumer demand which has kept refrigeration sales at a peak through depression years, strengthened by increased purchasing power and growing confidence, should make this goal, while not easy of attainment, entirely within the bounds of probability.

Large scale building activity will be one of the major reasons for improved conditions in 1936, I believe. People everywhere have more money to spend, and the growth of confidence which is everywhere apparent, should result in a major building boom this year. Figures show undoubtedly that a housing shortage is developing, and at a close estimate, the number of building permits for residential properties in 1936 should be increased over 1935 by about 75 per cent. In certain urban centers, including New York, Philadelphia, and Detroit, estimates on

increase in home construction range as high as 400 per cent over the previous year.

Investigation among Leonard dealers during 1935 indicates that the National Housing Act of the Federal Housing Administration Plan of Financing electric refrigerators was unquestionably of considerable assistance in boosting total sales, not only of refrigerators, but other electrical appliances as well. From a sales standpoint, the plan has proved successful for us. If it is continued in 1936, one thing which would prove helpful would be the participation of more banks than cooperated in the past year.

Leonard has no experience in air conditioning from which to draw, and therefore we prefer not to answer your question on this subject.

H. W. BURRITT,  
Vice President in Charge of Sales.

### P. CROSLLEY

**'Must Favor Continuation Of FHA Activities'**

Crosley Radio Corp.  
Cincinnati, Ohio

I do not believe 1936 electric refrigerator sales can go to two million units although it might come within a couple of hundred thousand of that.

There is some indication of considerable improvement in the building industry, particularly in the direction of residential buildings.

We must favor continuation of FHA activities because it has given us considerable volume of business in certain places.

In our opinion air conditioning is still quite in its infancy. We do not feel that we can make any suggestions regarding the stimulation of the sound development of sales.

POWEL CROSLLEY, JR.,  
President.

### W. G. SEEGER

**'No on Every Count; FHA Unsound'**

Seeger Refrigerator Co.  
St. Paul, Minn.

In replying to your telegram in which you ask my opinion on certain very pertinent questions my answer to them sounds to me like the answer of a real pessimist. Ordinarily I am not that.

The answer that I refer to is "no" to each of the questions, and the reason it is that way is that I believe to expect our Home Market to absorb two million household electric refrigerators is about two hundred fifty thousand too strong.

I must say "no" to your second question, and my reason is that although we have progressed quite a way on the road to recovery, I cannot help but feel that a very large part of that is an unhealthy growth, and that as we go along that sort of inflation will have to be absorbed by natural steady growth. So in 1936 we will be improving, at the same time not in such proportions as to produce a very large residential building activity.

As to the FHA financing plan, I think it is an unsound method of financing sales and should be changed to include a substantial down payment because as it is now it is most unjust.

I appreciate sincerely the opportunity of my expressing my opinions on these questions.

WALTER G. SEEGER,  
Vice President.

# Copeland's

## Greatest Year IS JUST AHEAD



**WHAT** progress in commercial refrigeration do you intend to make during 1936? There never was a better time to join with Copeland than right NOW! Copeland enters 1936 in an enviable business position. Production schedules have been speeded up—sales are up—product demand is up—and the big Copeland plant is humming with increased activity.

All units in the Copeland Commercial Line are built to high-precision standards. Such unusual quality assures unusual performance. You can sell Copeland because buyers want Copeland performance. Write us now about available territories.

**COPELAND REFRIGERATION CORP.**  
Manufacturers of a complete line of Household and Commercial Refrigeration  
Holden Ave. at Lincoln . . . DETROIT, MICH.

# Copeland

DEPENDABLE Electric REFRIGERATION



# SEE POSSIBILITY THAT SALES WILL REACH TWO MILLION

## Need to Educate Trade in Air Conditioning Practice

### C. R. D'OLIVE 'No Large Scale Building Until 1937'

Stewart-Warner Corp.  
1826 Diversey Parkway, Chicago

Replying to your telegraphic inquiry of Dec. 20, I wish to first point out that in giving you my opinions on the various points raised by you, I am not posing as an expert in such matters. I am merely giving you my opinion.

First: I think the industry will sell two million household electric refrigerators in 1936. I think that this figure will be reached due to the fact that there will be a certain amount of increased buying power, plus considerable increase in sales activity, together with the fact that the housewife of 1936 will enjoy the best financing terms in the history of the industry.

Second: I think that residential building will get under way in 1936 in a businesslike manner, but I don't think that it will reach large scale proportions until well into 1937.

Third: I see absolutely nothing wrong in the continuation of the FHA plan of financing refrigerator and other appliance sales.

Fourth: I don't know much about the air-conditioning market, but I would suggest that if you have a feature article each week built around an individual air-conditioning job in a small shop, an office, a small store, or a home, and outline in detail the installation problems encountered on that particular job—the time required to do the job—the cost of the job—the cost of operation, and also give operation data and candid camera photos of the job, plus the photograph of the man who sold it, and a statement of what the owner thinks of it now, you will be contributing a great deal toward acquainting distributors and dealers with the possibilities to be found in this new field.

I sincerely trust that you will enjoy a pleasant and profitable New Year.

CHAS. R. D'OLIVE.

### C. E. WILSON 'Appliance Industry May Expect Building Benefits'

General Electric Co.  
Bridgeport, Conn.

The following is in response to your wire of the 20th.

During 1935, General Electric sponsored a national architectural contest, the building of 300 "New American" homes, and organized "Houses, Incorporated." These activities were prompted by the belief that conditions warranted the active promotion of residential building.

It is my feeling that in 1936, renewed residential building will contribute in a very substantial way to general recovery and that in this fundamentally desirable activity, both public and private funds can be constructively employed. More and more, electrical appliances of every kind are accepted as essential parts of a modern home. Therefore, with the revival of home building, the electrical appliance industry may confidently expect to benefit indirectly from a substantially increased national buying power, and directly from the natural desire of hundreds of thousands of home owners.

C. E. WILSON.

### C. J. GIBSON '1936 Market Will Absorb 2,000,000 Refrigerators'

Gibson Electric Refrigerator Corp.  
Greenville, Mich.

In reply to your telegram, we believe that the market will absorb in 1936 two million household electric refrigerators.

We have just completed a Coast to Coast preview presentation to our distributors and we have never in our history experienced such enthusiastic reception and such frank statements as to the large increase in 1936 sales. Our distributors have backed up these statements by placing with us the largest quantity of orders that we have ever had in our history at this time of the year.

We feel that there will be a substantial increase in residential building activity during 1936. However, we do not look for a large scale residential building program such as was experienced a few years ago.

Based on the statements which have been made to us by dealers and distributors as to the very substantial benefit which has accrued to them through the National Housing Act and Federal Housing Administration plan of financing refrigerators and other appliance sales, we feel that a continuance of the National Housing Act would be of benefit.

We have always felt that the editorial policies of ELECTRIC REFRIGERATION NEWS have been of great benefit to the electric refrigeration industry and that ELECTRIC REFRIGERATION NEWS has been a major factor in the creation of better conditions in the industry.

CHARLES J. GIBSON, President.

### H. B. LINDSAY 'Sound Development and Education Needed'

Dry-Zero Corp.  
Merchandise Mart, Chicago

Replying to the questions in your telegram of Dec. 20th in the order asked:

(1) If general conditions do not backslide I expect to see an increase in the sale of electric refrigerators in 1936 over the present year, but I think that 2,000,000 is a little optimistic.

(2) While the Federal Government in its present cumbersome and expensive way is endeavoring to boost residential building activity and meeting with some results, I am inclined to think that the average person of some intelligence may be inclined to refrain from undertaking too great fixed obligations because he realizes that he is steadily being saddled with his proportion of huge and increasing debt and has got to carry on his shoulders an increasing number of political appointees, office holders, friends of the Party, and other more or less useless encumbrances. In other words, it depends upon how much the New Deal may develop into a New Steal.

(3) Standing by itself the FHA plan of financing electric appliances is stimulating, yet we also have to look at the possibility of repossessions and foreclosures, with the ultimate problem of how such repossessed goods are to be handled.

(4) You have answered this

question yourself with two phrases "Educational Program" and "Sound Development." Let's not encourage impossible claims for air-conditioning equipment of hopeless under-capacity. ELECTRIC REFRIGERATION NEWS is in a unique position to get and propagate the facts essential for satisfactory results. Any other course will affect the rapid development of this new industry along sound lines very adversely and greatly cut down its national development. The intrinsic value of an electric refrigerator is not clearly shown until it has been in use for a few years, but the capacity for air-conditioning equipment to make a house comfortable will show up very quickly.

All sound development is dependent upon factual education.

HARVEY B. LINDSAY, President.

### G. L. BRUNNER 'FHA Should Be Brought Back to Original Intentions'

Brunner Mfg. Co.  
Utica, N. Y.

In reply to your wire of Dec. 20th, I do not feel that I am competent to express an opinion on the potential market for household

refrigerators because I have for some time not been in touch with this branch of the industry; our efforts are in the main confined to the commercial division.

I do feel, however, that basic general conditions indicate a substantial upturn in the building of homes during 1936, but it is doubtful if the activity in this direction will gather sufficient momentum during the year to meet the optimistic predictions emanating from Washington. I rather look for 1937 to see the beginning of a major activity in this direction.

In regard to the National Housing Act, I am definitely not in favor of its continuance unless it is brought back within the scope of its original intention. I think there are great elements of danger in the way it is now being handled in the deferred financing of refrigerators and other appliances, which I am sure will prove disastrous in the future.

Many sales made under this set-up are forced, with the result that if care is not taken we will be faced with a flooded second-hand market in a few years, which will be very embarrassing. I think this applies more particularly to the commercial end of the industry than to the household appliance field.

My observation has been that many concerns are entering the air-conditioning field without proper knowledge of its conditions, which is always the fact in any new basic development. People are always anxious to get into new fields of endeavor and many times their training and knowledge of the industry are sadly lacking.

An editorial policy pointing out the pitfalls and the necessity for care in the development of this market would seem to me a worthwhile activity on the part of your Editorial Department.

G. L. BRUNNER.

### F. S. McNEAL

Universal Cooler Corp.  
Green and Melville, Detroit

You may be sure we appreciate the opportunity to go on record in the matter of certain factors of the refrigeration business. Just now, however, it seems that it would be best that we present none of our own views.

May I take this occasion to thank you for all the good you have done to help advance this great industry and to wish you continued success for 1936?

F. S. McNEAL, President.

Presenting  
**COPELAND for 1936**  
"The Class of the Field"



The  
**STYLE**  
Sensation of the Year  
The  
**SALES**  
Sensation of the Hour

COPELAND proudly presents this exquisite line for 1936. Here is breath-taking beauty that is completely irresistible! Massive cabinets, styled with a purity of design that will endure for years. Priced so astonishingly LOW that you will wonder how even we can do it! Cabinets of obvious quality construction. Many convenience features which are optional. Equipped with famous precision-built, smooth running, twin-cylinder COPELAND unit, with micro-honed mirror-finished cylinder walls, and diamond bored bearings. A HIT! The public will go for this beautiful low-priced line. See it! Study it! Marvel at it! Wire at once for franchise information! TRUSCON STEEL COMPANY, Refrigeration Sales Division, 615 Wayne Street, Detroit, Michigan.

The Four-in-One Food File—an entirely new convenience feature optional in Copeland models.



AMERICA'S MOST BEAUTIFUL ELECTRIC REFRIGERATOR



## ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office  
Copyright, 1936, Business News Pub. Co.  
Published Every Wednesday by  
BUSINESS NEWS PUBLISHING CO.  
5229 Cass Ave., Detroit, Mich.  
Telephone Columbia 4242.

Subscription Rates  
U. S. and Possessions, Canada, and all  
countries in the Pan-American Postal  
Union: \$3.00 per year; 2 years for \$5.00.  
All other Countries: \$5.00 per year.  
Notice: Pay no money to strangers claim-  
ing to represent this paper. We employ  
no subscription solicitors. Send orders  
and remittances by mail.

F. M. COCKRELL, Publisher

GEORGE F. TAUBENECK, Editor  
PHIL B. REDEKER, Managing Editor  
THEODORE T. QUINN, Assistant Editor  
FRANCES McNAMARA, Assistant Editor  
K. M. NEWCUM, S. L. POTTS, and  
J. J. MURRAY, Contributing Editors

GEORGE N. CONGDON, Business Manager  
ROBERT P. NIXON, Asst. Business Mgr.  
HELEN K. GILMORE, Asst. Business Mgr.  
R. T. CARRITHERS, Spec. Representative

JOHN R. ADAMS, Production Manager  
JEAN H. ADAMS, Subscription Manager  
LOLA E. DEW, Circulation Manager  
WINIFRED MERSON, Spec. Representative

Member, Audit Bureau of Circulations  
Member, Associated Business Papers

VOL. 17, No. 1, SERIAL NO. 354  
JANUARY 1, 1936

## Notes of Caution for 1936

TWO MILLION household electric refrigerators should be sold in 1936—if. Federal activities in reducing interest rates on installment paper, and in promoting a revival of housing construction, should be a big help to the electric refrigeration industry—but. Air conditioning seems to have a magnificent future in store for it and for the sales organizations which get into it—although.

Such is the tenor of the answers to the telegrams which ELECTRIC REFRIGERATION NEWS sent out to leading executives of the major manufacturers of electric refrigeration equipment this week. This telegram asked for estimates of the potential market for 1936, opinions on the FHA and the possibility of a building boom, and suggestions as to the needs of the air-conditioning business and its outlook.

Answers were almost uniformly optimistic, but many of them contained words of warning and caution which the industry should well heed.

"With the improved purchasing power we are already feeling, and which economists tell us should grow through 1936, the refrigeration industry can well budget 2,000,000 domestic refrigerators for the new year," writes P. B. Zimmerman, general sales manager of all General Electric appliances. And he gives his reasons:

"The excellent record of performance of most of the refrigerators already installed, and the lower and lower cost of electricity will give this business a forward stimulus.

"The industry's joint promotion of the complete electric kitchen will also add a new note of buying interest."

An "although" is appended to this rather general feeling by Walter Seeger, vice president of Seeger Refrigerator Co., cabinet maker to the industry. "Although we have progressed quite a way on the road to recovery," states Mr. Seeger, "I cannot help but feel that a very large part of that is an unhealthy growth, and that as we go along that sort of inflation will have to be absorbed by natural steady growth."

President George Mason of Kelvinator observes that "the spending power of the nation is increased, and I believe there will result a tremendous building boom in almost every state to meet the house shortage which is developing. It is my opinion that the number of building permits for residential properties in 1936 for the entire United States will be approximately 120,000 this year, as compared with only 70,000 last year.

"In certain centers of population, such as Detroit, Washington, Philadelphia, and New York, the increase in residential building will be considerably greater. It is estimated that building permits for homes in those cities this year will be from 300 to 400 per cent higher than in 1935."

To counterbalance this highly competent prediction, one in which most of the executives who answered the telegram concurred, President Harvey Lindsay of Dry-Zero Corp. delivers himself of this canny thought:

"I am inclined to think that the average person of some intelligence may be inclined to refrain from undertaking too great fixed obligations, because he realizes that he is steadily being saddled with his proportion of huge and increasing debt, and has got to carry on his shoulders an increasing number of political appointees, office holders, friends of the Party, and other more or less useless encumbrances. In other words, it depends upon how much the New Deal may develop into a New Steal."

Now as to the FHA and its guarantee of time payment paper—which has done so much to stimulate refrigerator sales during the last half of 1935. After thorough study of this situation, Vice President Henry W. Burritt of Leonard reports:

"Investigation among Leonard dealers during 1935 indicates that the National Housing Act of the Federal Housing Administration plan of financing electric refrigerators was unquestionably of considerable assistance in boosting total sales, not only of refrigerators, but other electrical appliances as well. From a sales standpoint, the plan has proved successful for us. If it is continued in 1936, one thing which would prove helpful would be the participation of more banks than cooperated in the past year."

Agreeing with Mr. Burritt, Vice President A. E. Allen of Westinghouse appends the following advice:

"I would like to say a word of caution, however, to all dealers and distributors of these products about the danger of too much high-pressure selling or unsound selling in connection with this plan. Such abuses of the plan will simply result in its ultimate withdrawal, to the detriment of the entire industry."

And G. L. Brunner of Brunner Mfg. Co. adds:

"I think there are great elements of danger in the way it is now being handled in the deferred financing of refrigerators and other appliances, which I am sure will prove disastrous in the future. Many sales made under this set-up are forced, with the result that if care is not taken we will be faced with a flooded second-hand market in a few years, which will be very embarrassing. I think this applies more particularly to the commercial end of the industry than to the household appliance field."

Air conditioning has been laboring under the handicap of having too much expected of it in too short a time. But that great things can be expected of it, given the proper "breaks," is the belief of President George Mason of Kelvinator, who avers:

"Air conditioning presents another service to the American public which will increase with rapid strides during 1936. From the standpoint of the public and the refrigeration dealer, it would be very helpful if some intensive and intelligent effort were placed behind an educational program designed to educate the public as to what true air conditioning consists of . . .

"There must be created a realization in the minds of dealers and the public that true air conditioning provides for heating and humidifying the air in the winter, and cooling and dehumidifying it in the summer, and provides proper circulation and cleanliness of the air at all times."

To which exceedingly clear summation of the case, Vice President Allen of Westinghouse enjoins the air-conditioning industry's dealers on the highly important subject of profits:

"I feel that one of the greatest handicaps this young industry has to bear today is the apparent inability of the dealers and contractors who are making the air-conditioning installations to properly figure their costs of doing business and to secure an adequate mark-up on their costs to enable them to stay in business and make a profit . . .

"I think too many people engaged in the air-conditioning business today look upon it as a contracting 'bidding' business, and have failed to provide in their organizations and accounting practices provision for constructive business-building effort."

And Mr. Brunner, foreseeing the important part ELECTRIC REFRIGERATION NEWS can play in holding the air-conditioning industry on an even keel, declares:

"My observation has been that many concerns are entering the air-conditioning field without proper knowledge of its conditions, which is always the fact in any new basic development. People are always anxious to get into new fields of endeavor, and many times their training and knowledge of the industry are sadly lacking."

And there you have it. Leaders of two great allied industries feel that there is a big business, and a profitable business, in sight for their dealers IF these dealers follow sound business practices and don't go haywire in their zeal to get volume now, and PROVIDING that the weight of the burdens imposed by New Deal extravagances doesn't break the backs of taxpayers individually and industry collectively. Grave apprehension over activities of the present administration seems to be felt by many of the executives.

Nevertheless, the general feeling is good—even excellent—despite the antics down at Washington. General impression seems to be that the services offered by refrigeration and air conditioning are so essential to the nation's health, comfort, and happiness that nothing short of a national or international collapse can forestall these related industries from realizing in 1936 a much bigger and more profitable volume of business than they have ever obtained before.

## The Trend to Smaller Boxes

AVERAGE retail price of household refrigerators came down in 1935, running to a new low of \$166. In 1934 the estimated average retail price was \$172.

However, it should not be assumed that this indicates a downward price trend. Rather, a study of 1935 sales statistics indicates that this situation is a result of a downward trend in the size of refrigerators sold.

Last year 98,987 refrigerators with less than 4 cu. ft. capacity were sold by Nema members, as compared with 38,151 of these extra-small sizes sold in 1934.

The obvious deduction is that as saturation of the market has progressed, it has become necessary to penetrate into lower and lower income classes by pushing small models with rock-bottom price tags.

A discordant note in this situation is the fact that in the lowest income bracket are generally found the biggest families, and hence that those who have the least capacity to pay frequently need the greatest capacity in their refrigerators.

Steps to make it easier for families in this classification to obtain adequate refrigeration facilities are being taken by several manufacturers this year, with the presentation of 6 and 7 cu. ft. boxes priced unusually low.

## Letters

### See You in 2 Weeks

Sherman Clay & Co.  
Kearny & Sutter Sts., San Francisco  
Editor:

For the past few years we have been one of your interested subscribers and the valuable information outlined in your columns is deeply appreciated, however, it is very noticeable that activities in refrigeration here on the Pacific Coast receive very little, if any, publicity in your paper.

Maybe it is because we are so far removed from the supposed center of things that time or space will not permit of our doings in the refrigeration field, yet by referring to your issue of Dec. 11, 1935, page 8, California is classed along with New York as leading the rest of the states in sales of refrigeration for October, 1935, and I believe some previous publications gave this glorious state out here the same distinction. Aside from that, we receive very little mention.

It has been suggested that it is just possible that other sections of the country need continuous publicity as to their accomplishments, to keep up the potential momentum. While here in California, your figures from time to time imply that only one other state surpasses us in volume of sales.

That one item gives us a proud feeling that we are a part of this great activity, and maybe a little honorable mention in your editorial columns would appeal favorably to us as well as others on the firing line, and please rest assured we are not writing this just to complain or even criticize, but we would like to let the rest of the refrigeration field know what's going on in our neighborhood. C. V. LEE, Mgr., Electric Appliance Dept.

Answer: The editor is leaving for the Pacific Coast next week on the first leg of a trip around the world, and hopes to write plenty about what's going on out there.

### E. T. Williams Misquoted

E. T. Williams  
Consulting Engineer  
51 East 42nd Street  
New York City

Editor: I find I have been misquoted in your current issue of December 18. This occurs on page 4, second column in paragraph starting at the fifteenth line from the top of the column, in the last sentence of the paragraph.

The error consists in stating that it took a longer time to kill the pigs with methyl chloride. I stated the exact reverse of this, and in confirmation thereof submitted the following figures taken from Test Series No. 3, made at Deepwater Point for Kinetic Chemicals, Inc. on Oct. 28 and 29, 1931. The tests were as follows:

**Methyl Chloride**  
Test 1-A, 8 1/2% by volume.  
First animal died in 3 hours, 30 minutes.  
Second animal died in 3 hours, 33 minutes.

Test 1-B, 3.3% by volume.  
First animal died in 6 hours, 30 minutes.  
Second animal died in 6 hours, 30 minutes.

**Methylene Chloride**  
Test 2-A, 5% by volume.  
First animal died in 1 hour, 42 minutes.  
Second animal died in 2 hours, 20 minutes.

Test 2-B, 3.3% by volume.  
First animal died in 2 hours, 55 minutes.  
Second animal died in 3 hours, 2 minutes.  
In the Proposed New York Code table classifying refrigerants, methylene chloride is classified as "Non-Irritant," meaning non-toxic, while methyl chloride is classified as "Irritant." The foregoing test data indicates that methylene chloride is much more toxic than methyl chloride.

With regard to the temperature at which Freon will decompose, I submitted a photostat of page 140 of the March, 1935, issue of *Refrigerating Engineering*, giving the temperatures at which decomposition will occur in the presence of various metals.

These data were taken from Kinetic Chemicals, Inc., Technical Paper No. 5, dated May 20, 1931. One of these photostats is enclosed, from which it will be seen that, in the presence of copper, lead, tin, zinc, and dural, Freon will decompose at less than 800° F. and that in the presence of solder (60 per cent tin and 40 per cent lead) Freon will decompose at 400° F. Freon will also decompose in the presence of any flame and even when contacting a lighted cigarette.

I would appreciate it if you would make this correction in your next issue.

E. T. WILLIAMS.

"Please send us four extra copies of the Dec. 11 issue. We wish to take this opportunity to express our appreciation of your publication and its value to our organization as a great aid in keeping up with the trends in the industry and feel that it is worth many times its subscription price."—William Fogel, Fogel Refrigerator Co., 519-23 Bainbridge St., Philadelphia.

## Canadian Subscribers

The Virginia Smelting Co.  
Manufacturers of  
Liquid Sulphur Dioxide  
Boston, Mass.

Publisher:

I have just inquired of our representatives in Toronto and Montreal, namely: Messrs. Bruce Ross, Ltd., 159 Bay St., Toronto, with reference to Canadian duty on American magazines. They advise:

"We understand the duty on American magazines is to be eliminated Jan. 1, this being one of the items in the tariff changes arranged with our Government."

I hope this will enable you to increase your circulation in Canada. We are satisfied from inquiries we have made that there are a good many people, particularly in the provinces of Ontario and Quebec, who ought to be interested in your magazine. We are anxious to get our advertisements before them, and I urge you to make a real effort to increase your Canadian circulation.

F. A. EUSTIS, Treasurer.

Answer: Beginning today the subscription price of the News in Canada will be the same as in the United States, namely \$3.00 per year. That is just half the rate we have had to charge while the special tariff has been in effect.

Efforts will be renewed to extend the circulation of the News throughout Canada and more attention will be given industry news across the border.

## He Missed His Patent

R. N. Bicknell Co., Inc.  
Distributor, Curtis Refrigerating Units  
568 Hammond St., Bangor, Me.

Editor:

Having been a constant reader of your valued paper I am asking a slight favor. On page 7 of your Dec. 18 issue you have a full page devoted to your report of 754 refrigeration patents.

If you had published mine, the number would have been 755 (joke). My patent on an expansion valve was issued Nov. 26 and is number 2,022,583.

I am wondering if your reports on patents issued are free or do we pay to have them published? If there is a charge for this service, please let me know the cost as I have two more patents that will be issued in the near future. R. N. BICKNELL.

Answer: If Mr. Bicknell will look on page 14 of the Dec. 25 issue he will find his patent reported and illustrated. The patents published in the Dec. 25 issue should have been published in the Dec. 11 issue, which accounts for Mr. Bicknell's anxiety.

No fee is charged for the publication of patents in ELECTRIC REFRIGERATION NEWS. Patents published are selected on the basis of their interest and importance to the refrigeration and air-conditioning industries.

## Italian Translation

Prof. E. Micheli  
Via Angello, 17  
Milano  
(Milan, Italy)

Editor:

In my capacity as a translator of languages, I am employed occasionally by Milan firms interested in refrigeration, to translate some of the most excellent articles in your paper.

At present I am engaged in translating into Italian the MASTER SERVICE MANUAL by K. M. Newcum. I am thus thoroughly familiar with your paper and in touch with some of the manufacturers of electric appliances and equipments.

Recently the chief engineer of a firm, here, asked me if I could find the American address of the "York Shipley Limited," supposed to be an American manufacturing company in whose products he is interested. I told him that it looks to me more like an English concern than an American one but he insisted that he knows it is American and in the refrigeration line, but cannot get to know the address.

I scanned your paper, at least the numbers that I have been able to handle recently, and failed to find trace of such company and yet the name of every manufacturer in your country is in it, I should vow.

Can you help me? If so, please do, and I shall be very grateful to you.

As the work of a teacher, interpreter and translator of English, has now practically become a dead letter in this country, can you recommend me to any firm who might require a correspondent in Milan—a thorough, go-ahead, honest, reliable man, for finding and supplying data and information with regard to prospective business, collecting debts, settling disputes, arranging and preparing the way for business?

With many thanks for your courteous consideration of this letter in any case.

E. MICHELL.

"I am returning your application, and wish to state that I have enjoyed reading your paper very much."—Frank R. Bader, 320 George St., New Brunswick, N. J.



## Commercial Uses

### Commercial Equipment Displays at State Fair & Conventions Increase Sales

SAN FRANCISCO — Displays of commercial refrigeration equipment at the California State Fair and at food merchants' conventions elsewhere in the state have enabled H. R. Basford Co., Kelvinator distributor here, to increase its commercial business 91 per cent over its 1934 record.

In 1934, its first year in the commercial field, the company sold 207 per cent of its factory-set quota.

Typical of the Basford Co.'s promotional work for its own and its dealers' commercial departments is the company's part in the recent convention of the California Retail Grocers and Merchants Association at Del Monte.

In addition to a display, in operation, illustrating methods of displaying whole and cut meats, delicatessen, bottled goods, dairy products, and the like, one of the company's men, Frank L. Pollard, was on the convention program to explain the part which refrigeration plays in good marketing and store profits.

Since there are only a few ways in which the small town merchant can tell his sales story to his customers, Mr. Pollard urged that they consider food display.

The part which proper refrigeration plays in display, Mr. Pollard told his listeners, can be realized when it is understood that 90 per cent of the money spent in food stores is spent by the housewife. Women, he said, are shrewd buyers, on whom the cleanliness of electrical refrigeration is not lost.

A second profit suggestion given the merchants was that they increase their sales of milk and beer. When a customer buys milk from a grocer, Mr. Pollard pointed out, he has to visit his store every day—and figures show that with every bottle of milk sold, 24 cents worth of other merchandise is sold with it.

Also, a person rarely buys a bottle of beer without also buying crackers, cheese, cold meats, or salad. The merchant can capture this "plus" business, Mr. Pollard told the grocers, with a modern beer and milk display case.

Attendance at the convention totaled 1,200. The Basford Co. sent out 2,700 invitations to the trade, and wholesalers distributed some 3,000 more. A follow-up of newspaper advertising and promotion resulted in several sales, Basford officials report.

### North Dakota Poultry Dealer Pays for Lipman With Gold Found in Geese—Believe It or Not

BELOIT, Wis.—This story has a "believe it or not" tinge to it, but General Refrigeration Sales Co. headquarters here swear that there are records on hand to prove it.

In one of the company's North Dakota branch office cities, there's a poultry dealer who is quite a large user of Lipman equipment. In his business, he kills and plucks the fowl only, leaving the cleaning and alterations up to the customer.

One day, shortly before Thanksgiving, one of his customers ordered two North Dakota geese for her family's Thanksgiving dinner. When she opened them up in her home, she found a sizeable gold nugget in the innards of one and gold dust inside the other. This she reported to the poultry

dealer. Immediately, all sales of undressed geese by the store were stopped—while the dealer went on a gold hunt of his own.

There was a \$500 payment on the latest Lipman purchase due Nov. 20, but when the branch manager called around to collect, the dealer stalled him off, asking him to come back the Monday after Thanksgiving. Meanwhile, Mr. Dealer set to work cleaning and dressing all North Dakota geese, panning every one for gold.

Monday came, and the \$500 payment was made, as promised—most of it made up of the gold which the dealer had salvaged from the internal works of his geese.

Even the geese, it seems, work for Lipman in North Dakota.

### 148 Feet of Warren Cases Using Fedders Coils Installed in Monster Cambridge Food Mart

CAMBRIDGE, Mass. — Thirteen porcelain display cases with a combined length of 148 feet, built by The Warren Co. and equipped with Fedders coils, have been installed in R. H. White Co.'s monster new Foodmart opened here recently.

Selling space in the White Co.'s market covers an area of 18,000 sq. ft., with an almost equal amount of space devoted to the handling, storing, and refrigerating of products which the store sells.

Ten of the Warren cases are of 12 ft. size, two are 10 ft. units, and the other an 8 ft. one. All have Fedders flat tin commercial evaporators installed in the top.

Insulation consists of five inches of corkboard in the walls and bottoms. Other features are dehydrators for removing moisture from the cases, exterior lighting, moulded rubber doors, and oak frame construction. Fish and corned beef cases are equipped with Monel metal bottoms.

The market also has two large walk-

in storage rooms, equipped with overhead trolleys. One room, measuring 13 ft. wide, 28 ft. long, and 10 ft. high, has four Fedders non-frost evaporators, with special drain baffles. The other room, 13 ft. wide, 20 ft. long, and 10 ft. high, has three Fedders coils.

Three butter boxes, 10 ft. long, 30 in. deep, and 8 ft. high, are cooled by Fedders unit coolers, and a kitchen storage box, 6 ft. by 8 ft. by 10 ft., is equipped with a Fedders Model 316 unit cooler, to preserve delicatessen specialties.

The market has even installed a florist box, which is also Fedders-equipped.

Complete installation was made in five days, under the direction of Joseph Huban, well-known refrigeration service and installation engineer. Warren Commercial Refrigerator Sales Corp. of New York handled sales and installation details, with the cooperation of the Cambridge branch of Melchior, Armstrong, Dessau Co.

### Small Town Merchant Installs McCrays in Second Store

GREENUP, Ill.—C. L. Moore, operator of Moore's Food Store, has installed McCray commercial refrigeration equipment in his second establishment, opened here recently.

About two years ago, Mr. Moore purchased a rebuilt 14x6 ft. cooler, with coils, and a Model R-10 double-duty case, as well as a Model T-6 delicatessen case. The cooler, used for both service and cooling freshly killed meat, is operated by a Model 1502 compressor, while the other equipment is operated by a Model 752 unit.

In his new store, Mr. Moore has installed a Model 932C and a Model F-6 display cases, as well as a used 7x5 ft. walk-in cooler, operated by a McCray compressor. He also replaced the Model T-6 in his first store with a Model F-6.

His total power bill for the month of May, this year, was only \$8.12—which probably helped settle the fact that commercial refrigeration equipment was worth keeping.

### 4 Distributors Named By Holcomb & Hoke

INDIANAPOLIS—Holcomb & Hoke Mfg. Co. recently added four firms to its distributor-dealer organization to handle the H. & H. line of commercial refrigeration equipment.

The new outlets are: Bradshaw Music Co., in the Georgia territory; Chas. S. Martin, Frigidaire dealer, Athens, Ga.; Flint Refrigeration Co., Frigidaire dealer in the Alabama territory; and James W. Gerow, Tampa, Fla.

### Wisconsin Hospital Buys Lipman Units

MARSHFIELD, Wis.—Two Lipman commercial refrigerating machines, models 503 and 55, have recently been installed in a hospital here by the branch sales office of General Refrigeration Sales Co. at Madison.

The larger machine is being used on a drinking water system with 13 outlets, and on a few boxes and coolers. The smaller unit is used with an ice maker.

### Und-A-Bar Markets Combination Cooler

ST. LOUIS—Und-A-Bar Division of General Import Co. has introduced the Und-A-Bar, electric combination beverage and food cooler.

Designed, as its name implies, to fit under the bar, the cooler has overall dimensions of 72½ in. by 25 in. by 33 in., with a wet compartment 56 in. by 20 in. by 12½ in. and a dry compartment 12 in. by 20 in. by 12½ in.

The unit is all-metal and streamline in design, and is equipped with a Curtis refrigerating unit powered by a ¼-hp. Wagner motor. Automatic controls maintain temperatures of 33° to 36° F. at all times.

Standard color is light green, but other colors are available at extra cost. The unit is insulated with sheet cork. Lids slide on roller bearings, and compartments have adjustable partitions for separating brands of beverages. A storage shelf is below the unit.

### Myers Made Distributor Of Lipman Products

WEST PALM BEACH, Fla.—Myers Electric Co. has been appointed distributor of Lipman commercial refrigerating equipment in this territory. The company also has the franchise for Warren display cases and coolers.

### Service Firm to Handle McCray Cases

UTICA, N. Y.—Electric Refrigeration Service Co. of this city has joined the McCray Refrigerator Sales Corp. organization, operating under the W. W. Short distributorship, Syracuse.

## TEMPRITE

wishes you

a Happy New Year

and offers the Temprite Cooler, beer or water, as a sure means of making it prosperous.



TEMPRITE PRODUCTS CORPORATION  
1349 EAST MILWAUKEE AVE. - DETROIT, MICH.  
ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

# SEXTUPLETS ALCO HAVE ARRIVED! Announces

## SIX NEW SERIES "T" THERMO VALVES FOR AIR CONDITIONING AND PRODUCT COOLING

Look at these Features—

- 1 Series "T" Thermo Valves accurately control liquid flow at low superheat over a wide load range without flooding.
- 2 Reduce inherent cycling or hunting to a negligible minimum.
- 3 Available in a variety of capacities which permits close selection to meet all evaporator requirements.
- 4 Inlet and outlet connections are designed to adequately handle each refrigerant and tonnage requirement.
- 5 Made to accommodate the addition of external equalizing tubes to compensate for excess pressure drops between valve outlet and evaporator outlet.
- 6 Available with either insert or external remote bulbs.
- 7 Small in size and light in weight.

### Types TL and TCL THERMO VALVES

Type TL with Internal Superheat Adjustment.  
Net weight, 1 3/4 lbs. List Price \$12.00

Type TCL with External Superheat Adjustment.  
Net weight, 2 1/4 lbs. List Price \$15.00

Available with either S. A. E. Male Flare or solder line connections in all practical sizes

Constr. No.	00	0	1	2
CH 3 CL	1.2	2.6	5.6	8.4
SO 2	1.0	2.1	4.7	7.4
F 12	.6	1.3	2.9	4.4

### Types TAL and TDL THERMO VALVES

Type TAL with Internal Superheat Adjustment.  
Net weight, 2 lbs. List Price \$15.00

Type TDL with External Superheat Adjustment.  
Net weight, 2 1/2 lbs. List Price \$18.00

Available only with solder line connection, but will accommodate a wide selection of tubing sizes by the use of standard solder type coupling

Constr. No.	00	0	1	2	3
CH 3 CL	1.2	2.6	5.6	8.4	12.3
F 12	.6	1.3	2.9	4.4	6.2

### Types TBL and TEL THERMO VALVES

Type TBL with Internal Superheat Adjustment.  
Net weight, 2 1/2 lbs. List Price \$30.00

Type TEL with External Superheat Adjustment.  
Net weight, 3 lbs. List Price \$35.00

Available only with solder line connections, but will accommodate a wide selection of tubing sizes by the use of standard solder type coupling

Constr. No.	4	5	6
CH 3 CL	15.2	19.5	23.9
F 12	8.7	11.4	14.0

### Types TBL and TEL THERMO VALVES

Type TBL with Internal Superheat Adjustment.  
Net weight, 2 1/2 lbs. List Price \$30.00

Type TEL with External Superheat Adjustment.  
Net weight, 3 lbs. List Price \$35.00

Available only with solder line connections, but will accommodate a wide selection of tubing sizes by the use of standard solder type coupling

Constr. No.	4	5	6
CH 3 CL	15.2	19.5	23.9
F 12	8.7	11.4	14.0

Ask for technical Bulletin No. 144-D to get complete description of Series "T" Thermo Valves

Stocked by Leading Refrigeration Supply Jobbers

# ALCO VALVE CO., INC.

2628 Big Bend Boulevard • St. Louis, Mo., U.S.A.  
New York • Chicago • Los Angeles • San Francisco

Thermo Valves • Automatic Expansion Valves • Magnetic Valves • Float Valves • Float Switches for Usual Refrigerants



## Commercial Refrigeration

### Kelvinator Designs 2 Large Capacity Air-Cooled Units

DETROIT—Especially designed to meet the demands for a condensing unit for commercial refrigeration installation where use of water for cooling is unsatisfactory, a new 3-hp. and a new 5-hp. air-cooled condensing unit have been added to Kelvinator Corp.'s commercial line.

Similar in design to the other condensing units in the line, these two new Kelvinator units are mounted on standard blocks. They provide larger capacities of air-cooled condensing units than have been provided by Kelvinator previous to this time.

To permit the direct discharge of the air from the condensing unit into the outside air or into the air of another room, the condenser is furnished as a separate unit with individual motor and fan for remote installation. The large capacity of these two new units makes the use of the separate condenser necessary. An auxiliary condenser is mounted on the condensing unit base to provide for cooling of the cylinder head and final condensation.

The fan on the remote condenser is driven at a speed of 1,100 r.p.m. by a 1/2-hp. motor and provides an air delivery of 3,000 c.f.m.

Discharge from the condenser is through an opening 19 in. in diameter. A feature of the 5-hp. condensing unit is an oil separator.

### New Jersey Rules Cream Pastries Must be Kept In Refrigerated Cases

NEWARK—Stimulus to the sale of electric refrigeration equipment was given by the New Jersey State Department of Health ruling recently that bakers must store their cream and custard pastries in display and window cases cooled to 50° F.

Action of the Health department was based on cases of food poisoning said to have been caused from eating custard filled cakes which had been allowed to stand all night.

### Meter Purchase Plan Used On Super-Cold Cooler

LOS ANGELES—Prime feature of the sales campaign instituted by the Super-Cold Corp. to boost sales of its new electric bottle cooler, is a meter purchase plan by which the merchant can deposit 50 cents a day, and completely pay for the unit within 12 months.

Terms of the plan were devised so that the merchant could buy the cooling equipment with money he would otherwise spend on his daily ice bill.

### Temprite Installed in 5 Different Types of Business Firms

BIRMINGHAM, Ala.—Sales of water coolers for use in five different types of business concerns were reported recently by W. E. Scruggs, Temprite sales representative here.

Installations employing the largest number of units were made for office building use; 15 Temprite units were installed in the Brown-Marx building, while the Woodward Building purchased 10 Temprite water coolers.

Installations in department stores included: Joseph & Loeb, 7; Pizitz (store restaurant), 2; and Mellancon's, 5.

Single installations were made in the Birmingham News-Age Herald photographic department, and Woods drug store. Two water coolers were installed in the Alabama theater.

### Counter Freezer Group To Cooperate with Health Boards

CHICAGO—Plans to cooperate with state and local health boards in promulgating sanitary rules and regulations in the manufacture and distribution of ice cream and dairy products were included in the activities outlined in the yearly program of the Counter Freezer Association, when manufacturer members of the organization met here recently.

C. S. Clark was re-elected secretary-treasurer of the association, and Bank & Pollard, New York, Chicago, and Washington attorneys, were re-appointed to act as legal counsel.

The association will begin a drive to secure counter freezer users and allied industries as associate members.

### Kelvin Chests Planned For Small Outlets

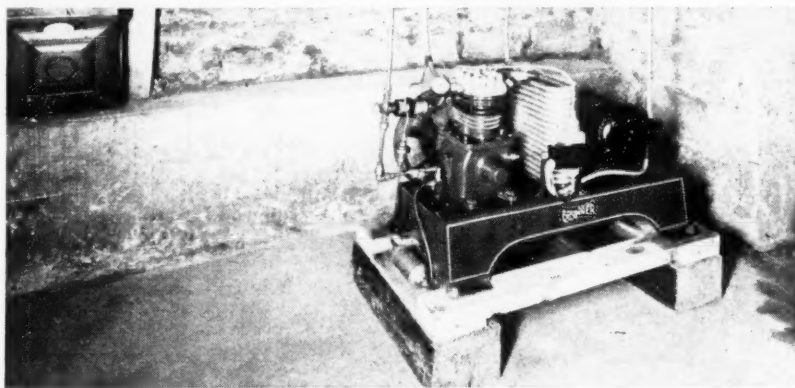
DETROIT—Two new self-contained Kelvin chest ice cream cabinets, for use in stores handling small quantities of ice cream, will be introduced by Kelvinator Corp. early in January, declares Edward R. Legg, manager of the National Direct Sales division.

New models will be of the three in line and four-hole double-row type, with cabinets similar in construction to the Kelvin chest model introduced last year. Cabinet finish is white Dulux, with square black lids.

The three-hole models will accommodate three 2 1/2-gallon cans of bulk ice cream or 12 to 15 gallons of packaged cream and novelties. Capacity of the four-hole double row model will be four 2 1/2-gallon cans of bulk or 16 to 20 gallons of packaged ice cream.

Cabinets were designed for the use of retailers who sell ice cream as a side line, states Mr. Legg.

## Tavern Installation



This neatly installed 1-hp. Brunner condensing unit is installed in a tavern on Chicago's south side. It supplies refrigeration to a 9x9x7-ft. beer pre-cooling storage room in the basement, a 4-tap coil box on the front bar, a 43x18x33-in. refrigerated compartment in the back bar, and 5 1/2-ft. refrigerated cabinet. The coil box is equipped with Draft-Rite units.

## Nine Commercial Manufacturers Report Profits for 1934; One Shows Loss; Difference Rested on Mark-Up

NEW YORK CITY—Of 10 manufacturers of commercial refrigerator cabinets and display cases covered in a Dun & Bradstreet survey of operating averages, nine reported net profits for 1934 averaging 11.73 per cent, and one firm reported a net loss of 12.3 per cent.

The 10 commercial refrigerator manufacturers reporting did a total net sales volume of \$6,006,217.

Two of the companies covered had 1934 sales of more than a million dollars; four of the firms did a volume in the \$250,000 to \$500,000 class; while the remaining four, including the one that showed a loss, did less than \$250,000 of business.

Outstanding difference in the operating averages of the nine firms that made a profit and the one that didn't was in the mark-up on cost of goods sold. Average mark-up for the concerns which made a profit was 90.94 per cent, while the company that was in the red reported a mark-up of only 19.40 per cent.

The survey presents 20 basic factors in two tables. Table 1 shows the composite averages of all contributing concerns in each division. Table 2 shows the analysis of the averages by sales volume.

The individual operating ratios were calculated by the following formulas: 1. Net Profit or Net Loss equals Operating Profit, or Loss, plus Other Income minus Other Deductions.

2. Operating Profit or Loss equals Gross Profit minus Total Overhead Expense.

3. Total Overhead Expense equals Total Annual Operating Cost.

4. Gross Profit equals Net Sales minus Cost of Goods Sold.

5. Cost of Goods Sold equals Beginning Inventory plus Purchases plus Labor and Manufacturing Expense minus Closing Inventory.

6. Mark-up (on Cost) equals Gross Profit divided by Cost of Goods Sold.

7. Raw Materials in Sales equals Beginning Inventory plus Purchases minus Closing Inventory.

8. Inventory Ratio equals Net Sales divided by Closing Inventory.

Each of these ratios, except Mark-up and Inventory Ratio, is shown in percentage of Net Sales. All Overhead Factors and all Other Factors are also shown in percentage of Net Sales.

These formulas are applied to the

individual cases, and are not applicable to the final group average figures.

### Table I Operating Averages of Contributing Concerns

Operating Factors	Averages of the 9 concerns which reported a net profit for 1934	Averages of the 1 concern which reported a net loss for 1934
1. Net Profit, or Net Loss	9.77%	12.70%
2. Operating Profit, or Loss	11.73%	12.30%
3. Total Overhead Expense	30.98%	28.50%
4. Gross Profit	42.71%	16.20%
5. Cost of Goods Sold	57.29%	83.80%
6. Mark-up (on Cost of Goods Sold)	90.94%	19.40%
7. Raw Materials in Sales	39.13%	48.50%
8. Net Sales to Inventory (Inventory Ratio)	6.08*	2.30*
<b>Overhead Factors</b>		
9. Advertising	1.60%	0.60%
10. Selling Salaries, Commissions, Traveling	9.42%	12.90%
11. All Other Selling Expenses	2.60%	3.30%
12. Rent	0.98%	...
13. Administrative and Office Salaries	12.63%	7.50%
14. All Other Administrative Expenses	2.63%	4.20%
15. Miscellaneous Operating Expenses	2.60%	...
<b>Other Factors</b>		
16. All Other Income	2.73%	6.60%
17. All Interest Paid	0.45%	5.30%
18. Losses from Bad Debts	1.57%	1.70%
19. Taxes and Tax Reserves	1.43%	...
20. All Other Deductions	1.95%	...

\*Times.

### Melchior, Armstrong Opens Two New Branches

NEW YORK CITY—Melchior, Armstrong, Dessau Co., refrigeration parts supplier, has opened new branch offices and warehouses at 85 Franklin St., Rochester, N. Y., and 1104 Bedford Ave., Brooklyn.

### Table II—Analysis of Averages by Sales Volume

Based upon reports of 10 refrigeration manufacturing concerns, with total 1934 Net Sales of \$6,006,217.

A 1934 Net Profit was reported by 9 concerns, or by 90.00 per cent of the total number. A 1934 Net Loss was reported by 1 concern, or by 10.00 per cent of the total number.

Net Sales Group	Averages of the 9 concerns which reported a 1934 Net Profit			Average of the 1 concern which reported a 1934 Net Loss
	Under \$250,000	\$250,000 to \$500,000	Over \$500,000	Under \$250,000
Number of Concerns	3	4	2	1
<b>Operating Factors</b>				
Net Profit, or Loss	13.13	8.05	8.15	12.70
Operating Profit, or Loss	16.17	9.95	8.65	12.30
Gross Profit	37.67	46.10	43.50	16.20
Total Overhead Expense	21.50	36.15	34.85	28.50
Cost of Goods Sold	62.33	53.90	56.50	83.80
Mark-up (On Cost of Goods Sold)	82.40	99.23	87.20	19.40
Raw Materials and Sales	42.00	36.30	40.50	48.50
Inventory Ratio	4.90	9.43	2.80	2.30
<b>Overhead Factors</b>				
Advertising	0.45	1.90	2.30	0.60
Selling, Salaries, Commissions, etc.	5.20	9.50	13.40	12.90
All Other Selling Expenses	...	1.10	4.10	3.30
Rent	0.20	0.90	2.10	...
Administrative and Office Salaries	9.55	18.70	3.55	7.50
All Other Administrative Expenses	3.35	2.03	3.00	4.20
Miscellaneous Operating Expenses	2.80	2.20	3.00	...
<b>Other Factors</b>				
All Other Income	2.05	1.13	5.80	6.60
All Interest Paid	1.50	0.80	2.75	5.30
Losses from Bad Debts	1.20	2.90	0.80	1.70
Tax Reserves	1.65	1.30	2.55	...
All Other Deductions	...	0.50	0.40	...

## Champagne Storage Vaults Cooled by Lipman Units

NEW YORK CITY—Lipman refrigerating equipment has been installed in the champagne storage vaults of McKesson & Robbins Co., Port of Authority building here, where more than a million dollars worth of the liquor is kept on hand at all times.

Equipment used in the vaults includes two Lipman Freon units of 15 and 7 1/2 hp., connected to five CU-2001 Lipman suspended air-conditioning evaporators.

Each of the evaporators has a capacity of 2,000 c.f.m., at .625 in. static pressure, when the air is discharged through duct work. Fan motor is 1/2 hp., 1,200 r.p.m. The CU-2001 is a suspended-type cooling unit designed especially for use with ducts.

The larger of the two rooms is used for wine storage, and is 124 ft. long, 36 ft. wide, and 14 ft. high. This is refrigerated by the 15-hp. Lipman compressor, and three of the five evaporators.

Smaller of the two rooms is 36 ft. long, 35 ft. wide, and 14 ft. high, and is cooled by the 7 1/2-hp. compressor, and two of the CU-2001 suspended units. Temperature in both rooms is held between 50° and 59° F. at all times.

## Fedders Coils Used in Dairy Restaurant

CLEVELAND—Popular new restaurant operated here by Telling Belle Vernon, National Dairy Co. subsidiary, is equipped with display cases built by A. Claus Mfg. Co., using Fedders evaporators, coils, and valves.

There are two 7-foot display cases in the restaurant, one used for cheese and the other for a variety of delicatessen products. Each case is equipped with a Fedders flat fin evaporator, 2 1/2 x 7 1/2 x 66 in., and an 8-tube finless coil 1 1/2 x 12 x 66 in.

Fedders valves complete the low side. The cases are connected to a 2-hp. water-cooled condensing unit, which also takes care of a 10 by 10 cooler, and a small soda fountain. Freon is used as the refrigerant.

A temperature of 52° F. is maintained in the cheese case, while the delicatessen and milk case is held down to 42° F. at all times.

The Fedders equipment was supplied by Debes & Co., Fedders distributor for the Cleveland territory.

## Special McCray Cooler Sold To Chinese Restaurant

NEW YORK CITY—A McCray special cooler 26 ft. long, 10 ft. deep, and 9 ft. 6 in. high, complete with machine equipment, has recently been installed in the Republic Chinese-American Restaurant at Broadway and 42nd St. here. Kung Wo Low, Inc., are operators of the establishment.

Sale of the equipment was made by Robert Johnston of the New York McCray branch, who sold the restaurant its original refrigerator some 20 years ago.

## Dairy Places Order for 20 Ice Cream Cabinets

LOS ANGELES—The Blossom Dairy, manufacturer of ice cream and dairy products here, recently purchased 20 Super-Cold 10- and 12-hole dispensing cabinets for installation in the markets where the company's products are handled. Equipment was purchased from the Super-Cold Corp. headquarters here.

## AIR CONDITIONING and COMMERCIAL WATER COOLING (Coolers Only)

SHELL & TUBE TYPE  
1-100 Tons  
1-1 Compressors  
F-12—Methyl

STORAGE TYPE  
All Sizes

WATER FILTERS

FILTRINE MFG. CO.  
Brooklyn, N. Y.

## HOME OF R-M REFRIGERATOR FINISHES



FOR APPEARANCE • COLOR  
DURABILITY and ECONOMY

## R-M REFRIGERATOR FINISHES

CHALLENGE COMPARISON

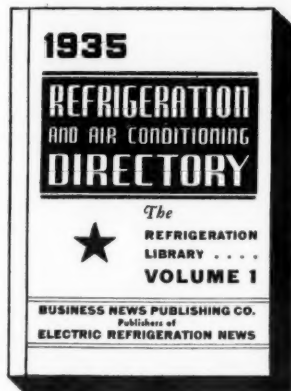


RINSHED-MASON CO.

5935-71 MILFORD STREET • DETROIT • MICHIGAN

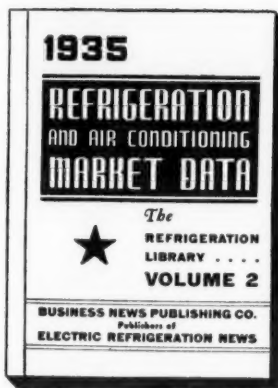


## The Refrigeration Library



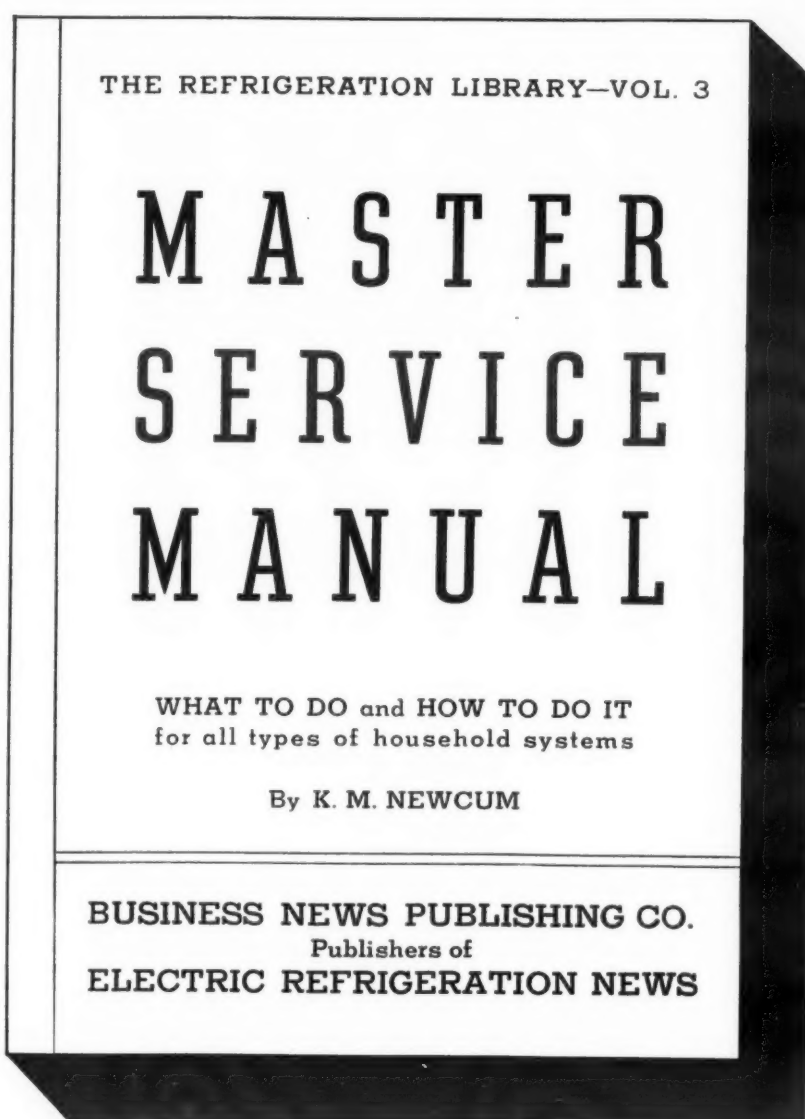
380 Pages—\$3.00

Every manufacturing executive, distributor, and dealer should have the Directory and the Market Data Book with their compilations of names and addresses, facts and figures, always available for reference use.



304 Pages—\$3.00

## Off the Press This Month



Approximately 400 Pages—Price \$3.00

Just the kind of book every service man has wanted. Written in simple and concise language, it gives the necessary instructions for installing and servicing all of the fundamental types of household systems. Detailed servicing instructions for more than a dozen orphan makes are also included.

The information is correlated so that quick reference may be made to any subject in solving problems in the shop or while at work on an outside job. The Manual is illustrated throughout with numerous photographs, drawings, and diagrams to make each operation entirely clear to the reader.

The Master Service Manual makes an excellent text book for the student or apprentice, and a valuable digest of practical information for dealers and salesmen.

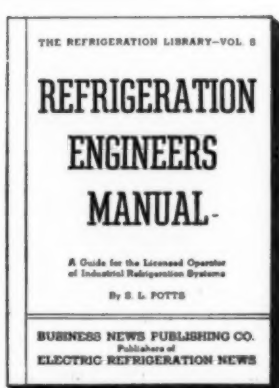
## New Books in Preparation



Approx. 300 Pages—\$3.00

The Specifications book, which dealers, salesmen, and service men have been wanting, will be ready March 1, 1936. Place your order now.

The Refrigeration Engineers Manual, now running serially in the News, will be offered in book form May 1, 1936.



Approx. 300 Pages—\$3.00

## Combination Rates

(Effective Jan. 1, 1936)

U. S. and Possessions and Pan-American Postal Union Countries	Price for books only postpaid	Price of books in combination with a one-year subscription to Electric Refrigeration News
Any 1 book	\$3.00	\$5.00
Any 2 books	5.00	6.50
Any 3 books	6.50	8.00
Any 4 books	7.50	9.00
All 5 books	8.50	10.00

All Other Countries	Price for books only postpaid	Price of books in combination with a one-year subscription to Electric Refrigeration News
Any 1 book	\$3.50	\$7.00
Any 2 books	5.50	9.00
Any 3 books	7.00	10.00
Any 4 books	8.00	11.00
All 5 books	9.00	12.00

## Group Subscription Rates

Many companies in all branches of the industry have indicated their interest in group subscriptions to Electric Refrigeration News and quantity prices on the Master Service Manual and other books.

The group rates below apply only to *paid-in-advance* orders. Charge orders are billed at the single-subscription rate, regardless of number. Papers or books will be mailed to individual addresses upon request.

### Electric Refrigeration News

	United States and Possessions, Canada, and Pan-American Postal Union Countries	All other Countries
1 subscription	\$3.00	\$5.00
5 or more each	2.75	4.75
10 or more each	2.50	4.50
20 or more each	2.25	4.25
50 or more each	2.00	4.00
75 or more each	1.75	3.75
100 or more each	1.50	3.50

## Quantity Prices on Books

	United States and Possessions, and Pan-American Postal Union Countries	All other Countries
1 copy	\$3.00	\$3.50
5 or more each	2.75	3.25
10 or more each	2.50	3.00
20 or more each	2.25	2.75
50 or more each	2.00	2.50
75 or more each	1.75	2.25
100 or more each	1.50	2.00

## Use this Coupon

Date .....

Business News Publishing Co.  
5229 Cass Ave., Detroit, Mich.

Enclosed is \$..... Please send me:

- ☐ The weekly issues of Electric Refrigeration News for 1 year.  
☐ The 1935 Refrigeration & Air Conditioning Directory.  
☐ The 1935 Refrigeration & Air Conditioning Market Data Book.  
☐ The Master Service Manual.  
☐ Refrigeration & Air Conditioning Specifications. (To be published March 1, 1936.)  
☐ The Refrigeration Engineers Manual. (To be published May 1, 1936.)

Name .....

Attention or In care of { .....

Street ..... City ..... State .....

Remarks .....  
 (Please indicate products sold or principal line of business.)

1-1-36



# The Refrigeration Engineer's Manual

By S. L. Potts

## Explanation of Principles and Methods of Refrigeration

### Chapter 1. Introduction

Refrigeration is the process of absorbing or removing heat from some object that is warm or hot, by placing the warm material in close proximity, or in contact with a cold material or substance. The cold material absorbs the heat contained in the warm or hot material—thus producing refrigeration, or a cooling effect in the warm material, and an increase in temperature or a change in form of the cold material.

Nature tries to maintain uniform temperatures in all adjacent bodies. When a warm and cold body are brought together, heat will flow from the hot to the cold body until their temperatures are the same.

The body receiving the heat is said to be absorbing heat; the body giving up the heat, is said to be refrigerated. In the broadest sense, refrigeration is the process by which heat is abstracted from one substance and absorbed by another, causing a reduction of temperature in the first, with an increasing temperature of the second.

Refrigeration is mostly understood to refer to temperatures of 40° F. and below. While absorption of heat may take place at higher temperatures, it is seldom considered as refrigeration. Cold is a comparative word, and compares the temperature of one body to that of another. Cold indicates the absence of heat only.

The general understanding of the meaning of refrigeration is that some object or material is cooled (the temperature lowered), below the temperature of the surroundings by the absorption or abstraction of heat from the object or material in question. As there is no known material that totally insulates heat, the process of refrigeration usually considers that this process of heat absorption is continuous, so that the lower temperature of the object or material is maintained over a long period of time.

#### Methods of Refrigeration

**Refrigeration Methods:** Refrigeration or the cooling of warm or hot material may be accomplished in many different ways. The usual methods are classified under two heads:

- First: Natural refrigeration.
- Second: Artificial refrigeration.

**Natural Refrigeration** is the process by which a material is cooled with-

out any mechanical work being done on it. This may be accomplished in many ways.

First: Cooling by melting solids (latent heat of the fusion of a solid, such as ice).

Second: Cooling by surface evaporation.

Third: Cooling by mixtures of various materials (i. e. ice and salt).

#### Cooling by Melting Solid

**Natural Refrigeration by Melting a Solid or by Latent Heat of Fusion (Melting) of Ice:** This method is very commonly thought of as the cooling effect produced by placing the warm or hot materials inside a refrigerator box, or a refrigerated room, or heat insulated space that is cooled by placing some very cold material, such as ice, in the same space.

The heat contained in the warm materials flows to the cold material (ice), causing the ice to melt at a low temperature (32°) thus absorbing an amount of heat equal to the latent heat of fusion of the ice. As soon as the ice changes to water, the water should be drained off through a trap. This method of refrigeration uses the latent heat of the fusion of ice (144 B.t.u.'s per lb.), to absorb the heat from the warm materials.

Temperatures below the melting point of ice (32°), cannot be produced by this method using ice alone. A well designed and properly insulated ice box can maintain a temperature of 40° F. readily, using ice as the cooling medium.

Slightly lower temperatures may be produced by using large volumes of ice and smaller volumes of warm material to be cooled when the ice box is well insulated and the doors kept closed, and the circulation of air inside the refrigerator is rapid and continuous. Without good circulation of air inside the refrigerator box, the cooling results will be poor.

Much lower temperatures may be produced with mixtures of ice and salt or snow and salt. Temperatures as low as 40° below zero may be produced with mixtures of snow and calcium chloride. Further details of freezing mixtures, will be taken up later.

#### Cooling by Surface Evaporation

**Natural Refrigeration Produced by Surface Evaporation** or by the evaporation of moisture. When a wet or moistened surface is subjected to the passage of a current of very dry air flowing over the surface, evaporation from the surface will take place at the temperature of the air. The evaporation requires that heat must be supplied equal to the latent heat of evaporation, which, if not supplied from some outside source, will be absorbed from the material presenting the wet surface. This absorption of heat from the material will produce a cooling effect in the material.

This method of cooling is the oldest and the simplest known method, and is used extensively in hot dry climates to produce refrigeration. The method consists of keeping the vessel containing the articles to be cooled, moist—and in a current of air, or keep them in a damp place where the air circulates freely. The evaporation of the moisture results in the desired cooling.

The desert water bag is a good illustration of this. The bag is made of canvass that allows a certain amount of water contained inside to leak through the canvass of the bag to the outside where the rapid evaporation of this moisture from the outside of the bag produces an absorption of heat from the remaining water inside, and thus lowers the water temperature.

This process of cooling takes place in all climates and at all temperatures, but the rate of cooling increases as the temperature rises, and as the air becomes dryer (less humid).

The human body cools by this method of evaporation. Moisture in the form of perspiration flows to the skin surface. When a current of air (a breeze) flows over the body, the cooling effect is very rapid—caused by the evaporation of the moisture from the body surface.

A larger body of hot water may be cooled very rapidly by causing a current of air to pass over the surface of the water. The larger the surface exposed, the more rapid the cooling. In order to produce a larger surface of water exposed to the action of the air, the water is broken into a fine spray.

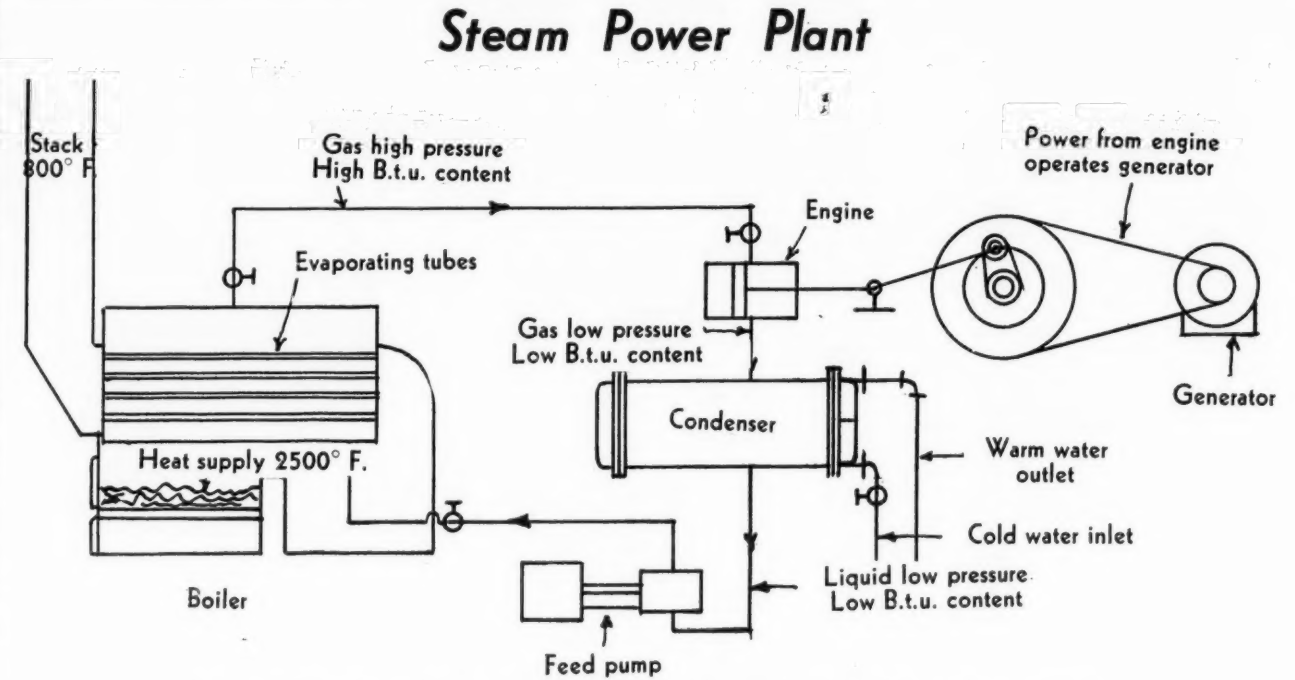


Fig. 1—Diagram of steam power plant (condensing) generating electric current.

This produces greater and more rapid cooling. This method is used in spray ponds and water cooling towers. The low temperature usually required for the refrigeration of perishable merchandise cannot be produced by this method as yet, although great advances have been made in the last few years.

Vegetables and fruit use this same process to produce a lower temperature within them, than the temperature of the air surrounding them. If a thermometer is placed inside of a potato, it will indicate a much lower temperature than it will when exposed to the air.

In hot summer weather, we sprinkle the lawns and pavements to cool and refresh us. This is surface evaporation from the lawns and pavement. The lake districts and the sea shore is always coolest in summer time, due to the evaporation from the large body of water cooling the air. This cooled air passes over the shore with the breeze, and the desired cooling results.

#### Cooling by Mixtures

**Natural Refrigeration by Mixtures:** Temperatures much below the melting point of ice (32°) can be produced by mixtures of two or more materials. Cracked ice and salt are used very extensively to produce freezing temperatures for ice cream, etc.

When the salt is added to the cracked ice, the freezing and the melting point of the ice are both lowered—and thus the heat is absorbed from the warm materials at a more rapid rate and at a lower temperature. The rate of absorption of heat is dependent upon the difference in temperatures between the melting point of the ice and warm material. The lower the melting point of ice, the more rapid the heat flow.

#### Mechanical Refrigeration

**Artificial or Mechanical Refrigeration:** This is a process by which any body of material or any substance is cooled by having mechanical work done on it, or on some medium used to produce the cooling effect. Artificial refrigeration is the process by which any body of material or any substance is cooled to a temperature below the surroundings by the rapid absorption of heat by some substance or chemical during a chemical or physical change of state.

A chemical change of state takes place when the atoms composing the original materials enter into new combinations after the mixture is complete. Some chemical changes require the transfer of large amounts of heat. The salts used in freezing mixtures are the salts of alkalies which possess the property of great solubility at low temperatures. The tendency of these salts to combine with water, and acids, or ice, is so great that the energy needed in the form of heat cannot be supplied from the surroundings at the required rate. So the deficiency of heat is taken out of the mixture itself. The result is a lower temperature in the mixture.

Refrigeration brought about by the chemical change process cannot be made a continuous cycle because it costs too much to restore the mixture to the original condition. Therefore new materials must be used and then the cost becomes prohibitive.

A chemical mixture of ice and salt is the cheapest and most common chemical change process used to produce low temperatures.

**Physical Change of States** takes place when a substance or material changes from one form to another without any new combinations being made or any new arrangements of the atoms. A change of form that is caused by the addition of heat to, or the abstraction of heat from water gives a good example of this physical change that all are acquainted with.

Water may be converted into a gas by the addition of sufficient heat. The gas will change back to water when sufficient heat is abstracted from the gas. If more heat is abstracted from the water, it becomes solid or ice, which in turn will become water

again if sufficient heat is added to the ice. The final result of all these changes is water, and is the same material we started with. No chemical change has taken place. All the changes were physical. Some of these changes require large amounts of heat to produce the change.

All refrigeration that is produced by artificial means can be classed under the head of mechanical refrigeration. While some cases seem to be border-line cases, they are classed here for want of a better classification.

#### Types of Mechanical Refrigeration

**Mechanical Refrigeration Is Divided Into Four Types:**

First: Liquid Vapor Process—using some volatile liquid.

Second: Permanent Gas Process—using compressed air.

Third: Vapor Vacuum Process—using water evaporated in a vacuum.

Fourth: Absorption Process—using a highly soluble gas such as ammonia in combination with liquid vapor process of number 1.

**Liquid Vapor Process** usually resorts to the use of some highly volatile chemical that will evaporate to a gas at very low temperature and under pressures that are possible to produce easily. In the process of evaporation, latent heat is absorbed by the evaporating medium. The latent heat thus absorbed by the evaporating chemical is taken from the material desired to be cooled.

The gases formed by this evaporating medium is drawn off from the evaporating coils compressed and condensed to a liquid, thus making the liquid available for use again to be evaporated and thus gather more heat from the materials to be cooled. This compression requires that mechanical work must be done on the gas. Ammonia (NH<sub>3</sub>), carbon dioxide (CO<sub>2</sub>), and sulphur dioxide (SO<sub>2</sub>) are three well-known chemicals used as refrigerants in this process. There are many others that will be taken up under the head of refrigerants.

**Permanent Gas Process—Dense Air Refrigeration** comes under the heading of mechanical refrigeration. Air is the medium used to produce the cooling effect, but no latent heat is absorbed by the air at any time, because it never changes its form. It always remains in the gaseous form of air.

If high pressure air that has been cooled to as low a temperature as possible is expanded under conditions that require heat to be used for the expansion, a lower temperature is produced in the exhaust air. This exhaust air is circulated through or around the material to be cooled. Thus it produces the desired cooling results.

**Vapor Vacuum Process:** this process is somewhat the same as the liquid vapor process. Instead of all the liquid evaporating and absorbing latent heat of evaporation, only a small part of the liquid evaporates. The evaporation takes place in a vacuum (low pressure), and under such conditions that little or no heat is supplied from the outside then the heat required for the evaporation comes from the liquid itself which causes a lowering of the liquid temperature.

This low temperature liquid is circulated through the refrigerator coils much the same as brine is circulated in brine coils. The small amount of liquid that is evaporated is drawn off by the vacuum pump and discharged to the air.

Water is the liquid that is used in this process usually. Water under a vacuum of 29.92 inches of mercury will evaporate at 32° F. To evaporate one pound of water under these conditions will require a large number of B.t.u., and if all these heat units are taken from the remaining water in the evaporator, the temperature of the water will be lowered considerably. The remaining cold water is circulated in the refrigerator to produce the cooling effect.

In considering this type of refrigeration, it is very evident that the vacuum pump that would be required for any very large capacity of refrigeration would soon reach prohibitive sizes, and would be impossible to operate at reasonable power cost. It can be seen also, that 32° F. would seem to be the lowest temperature possible with the evaporation of water alone, so the process is very limited in application.

A great deal of experimental work is now being done on this process of refrigeration. Many improvements have been made and are being made, so that this type of refrigeration looks promising for all cooling processes where only moderately low temperatures are required. Very low temperatures cannot be produced as yet.

**Absorption Process:** in this process of refrigeration, the high pressure side of the cycle is an exact duplicate of the liquid vapor process. In the low pressure side, the compressor is removed and in its place is put an absorber and a generator.

The absorber is usually a closed vessel partly filled with cold water. Cold water has a great affinity for ammonia, and will absorb large quantities of ammonia gas. This absorption of ammonia gas lowers the pressure on the gas. When the cold water has absorbed its full charge of ammonia gas, it is pumped into the generator and becomes heated.

Hot water cannot carry the same amount of ammonia gas, so some of it is driven off, producing a large increase in the volume, and producing the head pressure required for condensing the ammonia (NH<sub>3</sub>) gas to a liquid in the condenser. The rest of the cycle is the same as explained in the liquid vapor (compression) process.

Fig. 1 illustrates, by an outline drawing, the equipment used in a steam power plant operating a condenser to generate electric power. Fuel is consumed (burned) on the grates in the furnace to develop a high temperature. The products of combustion pass through the boiler tubes where the heat passes through the tube walls into the water surrounding the tubes. Thus the products of combustion are cooled. When sufficient heat has been put into the water, it changes into a gas (steam)

(Concluded on Page 13, Column 1)

INFORMAL TALK NUMBER 31



## Ride to a New High with the Help of Trained Men

Old 1935 is all washed up and out of the way. And right on its closing seconds comes 1936 with some of the same old problems and many new ones of its own... most of which of course, will be licked while the industry rides to a new high in a new year.

The problem of an adequate supply of properly trained men for refrigeration and air conditioning installation and service work has already been licked... for keeps. R-A-C-I Trained men will reduce the "service headache" to a minimum in 1936.

Write for details of this famous training endorsed by leading manufacturers and supervised by factory-appointed engineers.

**THE REFRIGERATION AND AIR CONDITIONING INSTITUTE**  
2130-2158 LAWRENCE AVENUE • CHICAGO



The Officially Endorsed School

**MCCORD**  
**Refrigeration**  
**PRODUCTS**

COMMERCIAL EVAPORATORS  
DOMESTIC EVAPORATORS  
CONDENSERS  
METLFLEX ICE TRAYS  
SPIRAL FINNED TUBING  
AIR CONDITIONING SURFACE

**MCCORD RADIATOR & MFG. CO. - DETROIT**



## Compression Refrigerating Plant

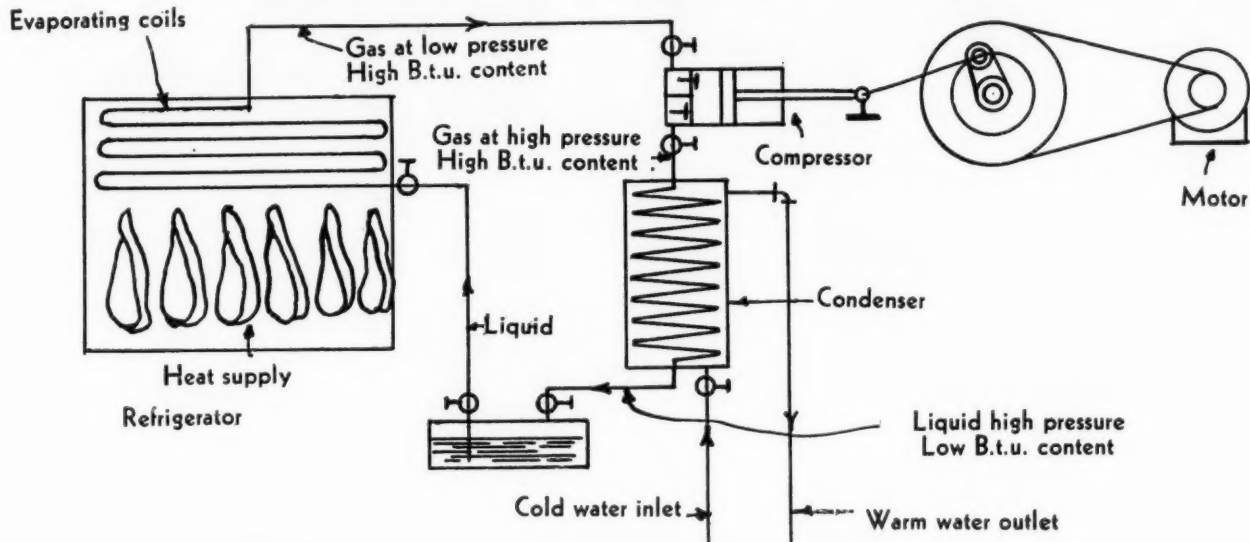


Fig. 2—Diagram of compression refrigerating plant using electric motor drive.

## Refrigeration Plant Operation Compared With Power Plant

(Concluded from Page 12, Column 5)

at the boiling point. This gas is at high temperature, high pressure, and contains a great number of heat units. (B.t.u.). This gas is used in a steam engine where some of the heat units are converted into work (mechanical energy), and delivered to the generator. The main output of this plant is electricity.

The exhaust leaving the engine is still in the gaseous form and contains a large number of heat units, but less than contained by the steam that enters. The heat that has been converted into mechanical work appears as condensation in the exhaust. By passing the exhaust through a condenser, the remaining latent heat is removed, the pressure is lowered, and the gas is changed to the liquid form. The heat content of the liquid is now very small. The liquid is returned to the boiler where the cycle is repeated.

### Compression Refrigeration Plant

In Fig. 2 is represented a compression refrigeration plant, using an electric motor for the driving power. By comparing Fig. 1 with Fig. 2, you will note that they both contain the same essential units in somewhat modified form. Electricity is used to generate mechanical power for this plant to operate the compressor, making it mechanical refrigeration.

The heat supply comes from the material placed in the refrigerator. The chemical refrigerant used in the evaporating coils evaporates (boils) at a very low temperature—changing into gas by absorbing heat from the materials in the refrigerator thus producing cooling of the materials in the box as the result.

The gas generated in the evaporating coils is drawn off by the suction of the compressor and compressed from low pressure to high pressure. The gases leaving the evaporating coils at low pressure and low temperature contain a large number of latent and sensible heat units (B.t.u.). As the pressure increases, the boiling point is raised and the condensing point is raised also. When the pressure and the condensing point is raised above the temperature of the condensing water, heat will flow from the gaseous chemical refrigerant into the cooling water in the condenser. This condenses the gas at high pressure to liquid at high pressure by removing the latent heat of the gas.

The liquid is kept at high pressure and at temperatures usually somewhat above the refrigerator temperature. In this state the liquid does not contain many heat units, only the sensible heat of the liquid.

When the liquid refrigerant passes the expansion valve, the pressure is lowered and with it, the boiling point is lowered. If the boiling point of the liquid (chemical) refrigerant is below the temperature of the materials in the refrigerator, heat will flow from the materials to the liquid refrigerant, changing the liquid to a gas, and the cycle will repeat from this point on.

The refrigerating plant is the exact duplicate of the power plant, with the exception that power is consumed in the refrigerating plant to compress

the gas, instead of generating power in the steam engine by the expansion of the gas. Heat is absorbed from the refrigerated materials to cool them, but this heat changes the refrigerant from a liquid to a gas at low temperatures and low pressures in the evaporating coils.

The boiler burns fuel to produce heat at high temperatures, which in turn forms steam in the boiler at high pressures and high temperatures. The high pressure gas produces energy when allowed to expand in the steam engine cylinder.

### Unit of Refrigeration

**Unit of refrigeration.** One ton of refrigeration is the abstraction or absorption of 288,000 B.t.u. in 24 hours' time.

This value is based on 24 hours as that time is the average over which the cooling effect is measured. One ton of refrigeration is equal to the cooling effect produced, or the heat absorbed by one ton of clear solid ice at 32° F. melting to water at 32° F. in 24 hours time. Each pound of ice so melted absorbs the latent heat of fusion of ice which is 144 B.t.u. The effect produced by one ton of 2,000 pounds of ice melting to water, would be equal to 2,000 lbs. × 144 B.t.u. = 288,000 B.t.u. in 24 hours.

This is expressed as the rate of cooling over a 24-hour period. This rate of cooling may be expressed in shorter periods of time such as

$$\frac{288,000}{24 \text{ hrs.}} = 12,000 \text{ B.t.u. per hour.}$$

That is, if 12,000 B.t.u. are absorbed per hour for 24 hours, the total of 288,000 B.t.u. will be absorbed in the 24 hours, or one ton of refrigerating work has been done. This rate of cooling may be expressed in terms of one minute,

$$\frac{288,000}{24 \text{ hrs.} \times 60 \text{ min.}} = 200 \text{ B.t.u. per minute.}$$

That is, if 200 B.t.u. are absorbed each minute for 24 hours, the total of 288,000 B.t.u. will be absorbed in the 24 hours, or one ton of refrigeration work has been done.

On ton of refrigeration is based on the cooling effect produced by the melting of one ton of ice in 24 hours, but this cannot be reversed. One ton of refrigeration will not produce one ton of ice in 24 hours under any actual operating conditions. The reason for this is, the water used to freeze into ice is never at 32° F. The ice is always made at temperatures below 32° F. (usually 15° to 18° F.). During the freezing period, a large number of heat units will leak into the freezing tanks which will have to be absorbed in addition to the 144 B.t.u. required to freeze the water at 32° F. to ice at 32° F.

### Standard Refrigeration Ton

**Standard ton of refrigeration** used on all liquid vapor compression systems and in absorption systems is taken at a suction temperature of 5° F. saturated, 19.6 lbs. gauge pressure, and a head temperature of 86° F. saturated, 154.5 lbs. gauge pressure. The liquid entering the expansion valve must be cooled 9° below its boiling point (77° F.). The suction gas must have 9° F. super heat (14° F.). These temperatures are taken in liquid line 10 ft. or less from expansion valve, and in the suction line 10 ft. or less from the compressor.

The number of pounds of ammonia required to be circulated to produce one standard ton of refrigeration, making no allowance for sub-cooling of liquid or superheat of suction gases is as follows:

Gas at 5° F. suction  
19.6 lbs. gauge saturated has ..... 613.3 B.t.u. per lb.  
Liquid at 86° F. head  
154.5 lbs. gauge saturated has ..... 138.9 B.t.u. per lb.

The heat absorbed by one pound of refrigerant is ..... 474.4 B.t.u. per lb.

Weight of ammonia per minute per ton of refrigeration is found by dividing 200 by the number of B.t.u. absorbed by one pound of ammonia

in passing through the refrigerator coils.

$$\text{NH}_3 \text{ per min. } \frac{200}{474.4} = .421 \text{ lbs. per min.}$$

The refrigerating effect produced in tons of refrigeration is found by the formula,

$$R = \frac{W(H-h)}{200}$$

The theoretical discharge from a compressor cylinder in cubic inches per minute that will be equal to one standard ton of refrigeration can be found by,

$$\text{Discharge} = .421 \text{ lbs. refig.} \times 8.15 \times 1728 = 5930 \text{ cu. in.}$$

.421 is the number of pounds of ammonia for one standard ton of refrigeration per minute.

8.15 is the number of cu. ft. of gas in one pound of ammonia at suction pressure of 19.6 pounds or 5° F.

1728 is the number of cu. in. in one cu. ft.

R is the refrigerating capacity in tons per 24 hours.

W weight of refrigerant passing expansion valve in pounds per minute.

H B.t.u. in one pound of refrigerant gas leaving coils.

h B.t.u. in one pound of the refrigerant entering the coils.

5930 cu. in. volume of gas actually discharged from the compressor in one minute will produce the cooling effect of 200 B.t.u. absorbed under standard operating conditions. If the suction pressure is raised or lowered, the volume of gas required to be discharged for one ton of refrigeration will change. If the head pressure is raised or lowered the volume of gas will change. 6,000 cu. in. of gas discharged per minute is frequently taken as equal to one ton of refrigeration for ammonia.

To find the refrigerating effect produced by ammonia at different pressures and cubic feet per ton discharged, see table 9 and 10.

### Refrigerants

**Refrigerant** is the working fluid or substance that by its action in a container absorbs heat from other materials and thus lowers the temperature of the latter material. The refrigerant is the medium that removes the heat at temperatures below that of the medium to be cooled. If this latter statement qualifying the above was not made, condensing cooling water used in a steam condenser might be considered a refrigerant, but it is not, because it removes the heat at a temperature greater than that of the material to be cooled, and is not a refrigerant.

**Refrigerator** is the container, or the closed space, insulated room, or vessel in which the cooling action takes place. The refrigerator can take any form or size depending on the requirements of the case, and the space required for the storage of the materials to be refrigerated (cooled). The six enclosing surfaces are usually built and insulated against the passage of heat to the best extent known with the cost as the only limit of the insulation installed.

There is no known material or method that totally insulates heat. Many materials offer great resistance to the passage of heat, but in time, some heat will pass. The better the insulation, the more effective the cooling process will proceed inside the box, because the cooling will be concentrated on the materials to be cooled instead of removing the heat that leaks into the box or space.

**Boiling or ebullition** is the process by which a liquid is changed into a gas by the addition of latent heat where the change of form takes place from within the liquid. Boiling in many liquids takes place at high temperatures, and is very rapid in the part of the liquid in contact with the surface through which the heat is transmitted to the liquid.

**Boiling point** is the temperature of the liquid at which it changes its form to a gas by the addition of latent heat. When a liquid contained

in a vessel is heated to the boiling point, small bubbles of gas form within the liquid, and on the surface of the container through which the heat is passing.

These bubbles increase in size and eventually rise through the liquid to the surface where they are released as a gas. Boiling is the process of change of form that takes place from within the liquid by addition of latent heat to the liquid. Boiling is the process used to produce large quantities of vapor under pressure.

### Rate of Boiling of Liquids

The rate of boiling of liquids is dependent upon,

- (1) The intensity of heat supplied,
- (2) The pressure on the liquid,
- (3) The nature of the liquid.
- (4) The difference in temperature.

**Condensing point** is the same temperature as the boiling point. Condensing requires that the latent heat be removed from the gas in order to return it to the liquid state. In boiling the latent heat is added to the liquid at the boiling point, in order to change the liquid into a gas.

**Evaporation** is the process by which a liquid changes into a gas at any temperature by the addition of latent heat where the change of form takes place from the surface of the liquid exposed. This is a surface action only, and takes place at all temperatures, at all pressures, and at all times, and requires the addition of latent heat just the same as in boiling.

Water left in an open vessel evaporates. Some liquids evaporate more rapidly than others. Alcohol evaporates more rapidly than water. Ether evaporates more rapidly than alcohol.

### Rate of Evaporation

The rate of evaporation of liquids increases with

- (1) an increase of temperature.
- (2) an increase of liquid surface exposed.
- (3) a decrease of humidity in the air.

(4) an increase in the rate of vapor removal from the surface of the liquid.

(5) a decrease of pressure on the liquid.

The rate of evaporation of liquids varies greatly with different liquids and whether the liquid is pure or contains mixtures of other materials or other liquids. Evaporation at high pressures and at low or moderate temperatures would be exceedingly slow and totally impractical for power plant purposes.

**Vapor saturation point (vapor tension).** All liquids evaporate at all temperatures and at all pressures. In a perfect vacuum, all volatile liquids start to give off vapor at once. As soon as the liquid begins to give off vapor, the space in the containing vessel ceases to contain a perfect vacuum. If the temperature remains constant, there is a point reached where no more vapor will be given off (evaporation ceases).

This point is said to be the saturation point for that temperature because the vacuum is no longer a perfect vacuum but only a partial vacuum as it contains some liquid vapor. If the vapor is removed from the

vessel continuously and a perfect vacuum is maintained, the liquid will continue to evaporate and give off vapor and the temperature of the remaining liquid will be lowered and if water is used as the liquid it may eventually be frozen.

### Saturation Point

The saturation point of the liquid depends on

- (1) the pressure on the liquid.
- (2) the temperature of the liquid.

**Specific heat** of any material is the amount of heat that is required to raise one pound of material 1° F. Water is taken as the standard of comparison for all liquids and solids. One pound of water requires one B.t.u. to raise its temperature 1° F.

**Specific heat of substances** varies for the same substance at different temperatures. Water varies very slightly but is uniform enough for all practical purposes.

The **mean specific heat** is used to give the average for some temperature range.

### Specific Gravity

**Specific gravity** of a material is the ratio of the weight of one unit of volume of the material compared with a like volume of water. Specific gravity of water is one (1) and all other materials are compared to water. For some materials, the ratio is greater than 1. These materials will sink in water. For other materials, the ratio is less than 1, and these materials will float on water.

**Density** of material is the weight of the material for one unit of volume. The density and the specific gravity are directly related to each other.

**Head pressure** is the pressure that is required to be maintained on the condenser and up to the expansion valve in order to produce condensation of the gas (refrigerant) with the cooling water available for condensing.

### Suction Pressure

**Suction pressure** is the pressure that is required to be maintained in the evaporating coils of the refrigerator box in order that the boiling point of the refrigerant will be such as is required to produce the desired temperature in the refrigerator box. The suction pressure is the pressure at which the gases reach the compressor. This pressure may be expressed as gauge pressure or absolute pressure.

Frequently the suction is expressed as a temperature of the gas in the evaporating coils. Knowing the temperature, the pressure that corresponds to the temperature can be found from the ammonia tables.

**High side of system** extends over all that part of the plant between the discharge side of the compressor, and up to the expansion valve. This includes all parts of the system that carry the high pressure refrigerant. It may be either gas or liquid.

**Low side of the system** extends from the discharge side of the expansion valve up to the suction side of the compressor. This includes all parts of the system that carry the low pressure refrigerant. It is most always gas.

(To Be Continued Next Week)



**ANSUL CHEMICAL COMPANY**  
MARINETTE \* \* \* \* \* WISCONSIN

"GENUINE DETROIT"

HEATING, REFRIGERATING AND  
AIR CONDITIONING CONTROLS



**DETROIT LUBRICATOR COMPANY**

DETROIT, MICHIGAN, U.S.A.  
Canadian Representatives: RAILWAY AND ENGINEERING  
SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg



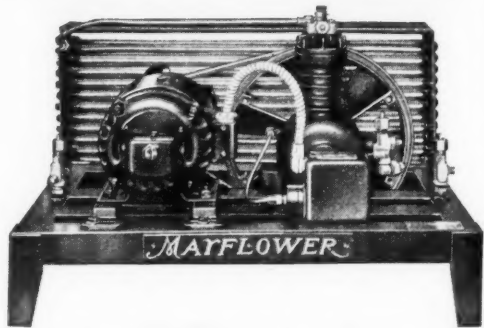
## The Buyer's Guide

Suppliers Specializing in Service to the  
Refrigeration and Air Conditioning Industries

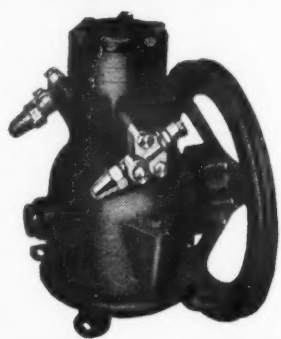
### HARDY "Mayflower" Compressors

exclusively manufactured for  
Commercial use, are the units  
which have long met with  
general approval.

For dependability and genuine  
satisfaction, dealers are  
recommending this equipment



HARDY MANUFACTURING CO., Inc., 100 Davis Ave., Dayton, Ohio

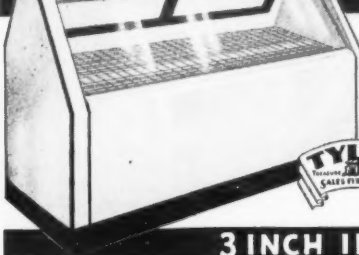


CONDENSING UNITS  
AND  
COMPRESSORS  
FOR HOUSEHOLD REFRIGERATION  
BY

**JOMOCO, INC.**

A SUBSIDIARY OF THE  
JOHNSON MOTOR CO.  
Waukegan, Ill.  
CABLE ADDRESS: JOMOCO-WAUKEGAN

## TYLER'S NEW WELDED STEEL REFRIGERATOR CASES



At last a general purpose case at a sensible price.  
Offers every advantage of the most costly cases at  
tremendous savings. Modern in every detail. Comes  
equipped with coils. Single and double duty models.

### AN AMAZING VALUE

Hundreds in use. Every store and market a prospect.  
Home Equipment Company, Fort Wayne, Ind., sold  
nine cases in two weeks. Write or wire for all the facts.

TYLER Sales Fixture CO., Dept. E, Niles, Michigan

3 INCH INSULATION—TRIPLE GLASS



THE ONLY PISTON RING  
DESIGNED & DEVELOPED  
Exclusively for Refrigeration

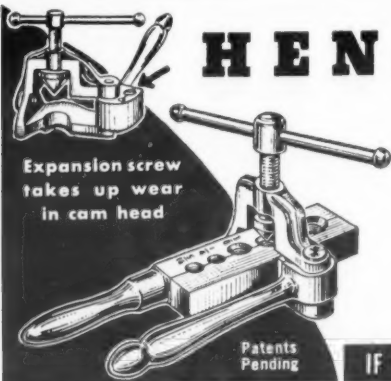
The Ring with  
a bearing face.  
A bearing for  
the ring against  
the cylinder wall.



Longer Life  
Less Friction  
Better Seal  
No Seuffing  
Burnishing Cylinder

DEALERS — JOBBERS — SERVICE MEN

Write for Details — SKINNER CHUCK CO., NEW BRITAIN, CONN.



## HENRY FLARING TOOL

Expansion screw  
takes up wear  
in cam head

The flaring tool that is the fastest and  
easiest to operate! Sturdy and lasts  
longer. Adjustable cam lever locks  
the tube in place in carbonized  
clamping blocks. Greatest locking  
pressure is always exerted directly  
opposite the tube. For 1/4", 5/16",  
3/8", 1/2" and 5/8" tubing. Each, \$4.55.

**HENRY VALVE CO.**  
1001-19 N. Spaulding Ave., Chicago, Ill.

IF YOUR JOBBER CAN'T SUPPLY YOU, ORDER DIRECT



## PURO ELECTRIC WATER COOLERS

Thoroughly reinforced all steel attractively  
finished cabinets.

Different models of varying capacities.

Write for details and sales prices.

Puro Filter Corporation of America

440 Lafayette Street, New York City

Spring 7-1800

Domestic ... Commercial ... Air Conditioning

## REFRIGERATION PARTS FOR ALL MAKES

100%  
WHOLESALE  
"We Protect  
the Dealer"

You can always depend on us for lowest  
prices and speedy service. Our big  
catalog showing America's largest line  
free to all legitimate dealers and service  
companies. Write today on your letter-  
head.

**The Harry Alter Co.**  
Main Office 1728 So. Michigan Ave.,  
and Warehouse CHICAGO, ILL., U.S.A.

Send for  
Our Big  
Bargain  
Catalog

## Dry Goods Men Will Study Combination Financing Plans

NEW YORK CITY—How retailers  
can increase their business—and  
profits—by combining sales of related  
household goods, at short term credit,  
with sales of longer term FHA-  
financed appliances, will be an im-  
portant subject of discussion at the  
meeting of National Retail Dry Goods  
Association in Hotel Pennsylvania  
here Jan. 20 to 24.

The plan, which would permit the  
handling of FHA sales in conjunction  
with other types of goods of an allied  
character, but not insurable under  
FHA terms, was discussed in a recent  
conference between Harcourt Mitchell,  
director of the FHA industries division,  
and Saul Cohn, chairman of  
N.R.D.G.A.'s housing committee.

"There is not sufficient understand-  
ing on the part of the retail trade  
of the ability to uncover prospects  
through FHA sales," Mr. Cohn says.  
"The public is ready to buy many  
items which are not eligible under  
FHA, but which could be tied into  
the same selling effort, when the  
customer once evidences interest in  
an insurable item."

Methods of handling FHA sales in  
conjunction with short-term credit  
business, suggested by Mr. Cohn, were:

(a) To wrap up groups of related  
items, mainly in the house furnishings  
departments, in one package of credit,  
using a short term club plan, or time-  
pay plan, for the items that are of a  
minor character and which wear out  
rapidly or have a shorter span of life,  
and using the long term credit—three  
years—for items which might be  
termed "long term goods."

(b) Where the income of the cus-  
tomer warrants it, an effort might be  
made to synchronize a budget of pur-  
chases with an available income over  
a period of years, and handle the  
whole transaction so that the customer  
is not limited to the purchase of  
insurable goods and the sale is not  
contracted under the narrow limits  
of what can be sold under the FHA.

The FHA is willing to send its  
representative into a retail store, for  
the purpose of teaching the credit  
department the practical side of the  
handling of credit, and the method of  
selling the type of credit which is  
insurable under FHA, Mr. Cohn stated  
following the conference.

FHA would also send its representa-  
tive into a store to arrange exhibits  
as well as pass on to the store's  
personnel any experiences which have  
been encountered in selling the items  
insurable under the law.

## Crosley Offers Radio Chassis for Use in Old Cabinets

CINCINNATI—As an aid in selling  
owner-prospects who wish to bring  
their radio sets up to modern effi-  
ciency at a minimum cost, Crosley  
Radio Corp. is offering its 1936 all-  
wave chassis for installation in their  
present cabinets.

Through this plan, Crosley hopes to  
reach those radio owners whose  
present sets are not up-to-date as far  
as reception is concerned, but who  
hesitate to change because their  
cabinets represent a considerable in-  
vestment, several hundred dollars in  
some cases. The company estimates  
that there are 10 million such sets  
in use today.

Chassis available range in price  
from \$34.20 for a six-tube, three-band  
receiver, to \$84.70 for a 10-tube, five-  
band model. Other models are:

Model 655—six metal tubes, three-  
band receiver, \$39.65; model 715, seven-  
tube, three-band, \$48.10; model 725,  
seven tubes, five-band all-wave, \$56.35;  
model 855, eight metal tubes, three-  
band, \$58.15; model 865, eight metal  
tubes, five-band all-wave, \$68.85;  
model 915, nine tubes, five-band all-  
wave, \$69.75.

Each chassis is equipped with a  
walnut veneer instrument panel. Sev-  
eral panel cut-out designs are also  
furnished, so that an inconspicuous  
opening can be made on the old panel,  
through which the new one can be  
exposed.

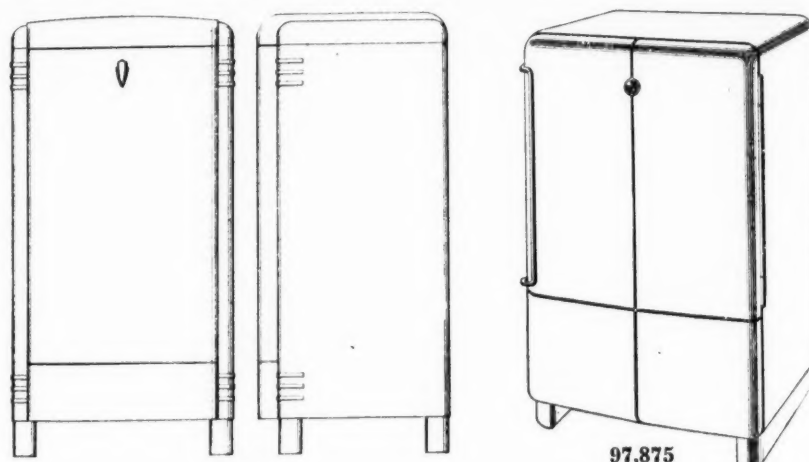
Dimensions of panels for models  
635, 655, and 715 are 9 1/2 in. square;  
for all other models, 10 1/2 in. square.

## All-Electric Kitchen Used To Introduce New Line

BRISTOL, Conn.—To introduce its  
new line, C. Funk & Son, Inc., newly  
appointed G-E dealer in this city,  
opened a department equipped with a  
General Electric kitchen, and a com-  
plete line of appliances.

Initial promotion used by the new  
dealership was a cooking school con-  
ducted by Miss Hazel M. Fletcher,  
home economist of Modern Home  
Utilities, Inc., G-E distributor.

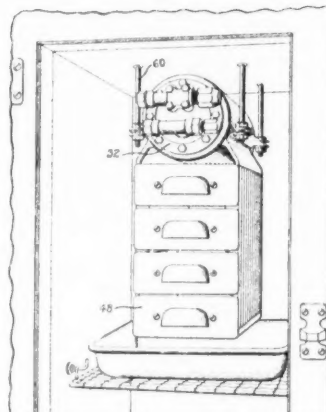
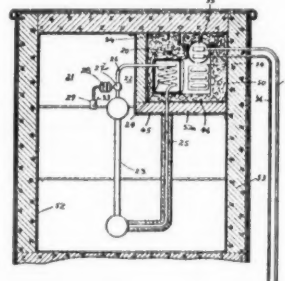
Harry L. Parsons is manager of  
the Funk Co. appliance department.



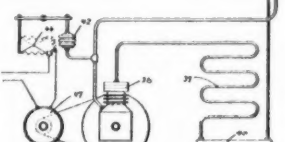
97,851

97,875

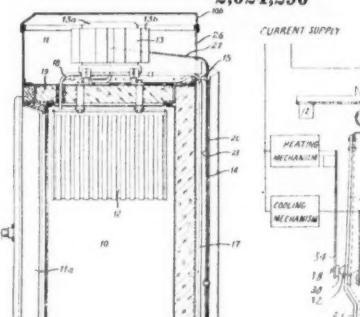
2,024,977



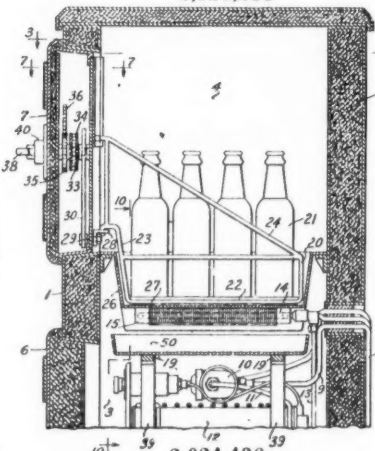
2,024,266



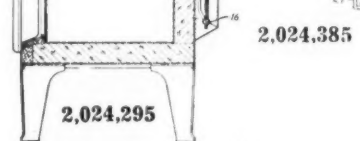
2,024,290



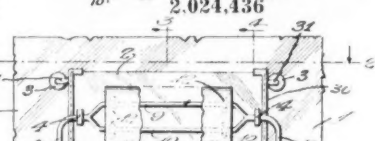
2,024,385



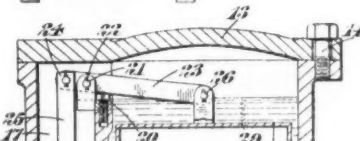
2,024,436



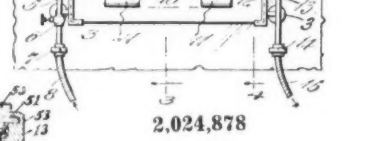
2,024,295



2,024,878



2,024,721



2,024,612

## Patents

Issued Dec. 17, 1935

2,024,266. REFRIGERATING APPA-  
RATUS. Frank W. Andrews, Dayton,  
Ohio, assignor, by mesne assignments, to  
General Motors Corp., a corporation of  
Delaware. Application Sept. 28, 1927. Serial  
No. 222,653. Renewed July 12, 1934. 4  
Claims. (Cl. 62-126.)

2,024,290. REFRIGERATING APPA-  
RATUS. Harry B. Hull, Dayton, Ohio,  
assignor, by mesne assignments, to  
General Motors Corp., a corporation of  
Delaware. Application May 28, 1930. Serial  
No. 456,682. 4 Claims. (Cl. 62-6.)

2,024,295. REFRIGERATING APPA-  
RATUS. Andrew A. Kucher, Dayton, Ohio,  
assignor, by mesne assignments, to  
General Motors Corp., a corporation of  
Delaware. Application Nov. 26, 1932. Serial  
No. 644,476. 10 Claims. (Cl. 62-116.)

2,024,385. HEATER-COOLER THERMO-  
STAT. Lawrence M. Persons, Des Moines,  
Iowa, assignor to Penn Electric Switch  
Co., Des Moines, Iowa, a corporation of  
Iowa. Application Oct. 29, 1934. Serial  
No. 750,493. 11 Claims. (Cl. 236-1.)

2,024,436. REFRIGERATOR. Earl E.  
Eickmeyer, Dayton, Ohio, assignor to the  
Dayton Pump & Mfg. Co., Dayton, Ohio,  
a corporation of Ohio. Application July  
19, 1934. Serial No. 736,102. 11 Claims.  
(Cl. 62-116.)

2,024,471. TEMPERATURE REGULAT-  
ING DEVICE. Aaron F. Norton, Los  
Angeles, Calif. Application March 30, 1934.  
Serial No. 718,222. 1 Claim. (Cl. 200-138.)

2,024,612. REFRIGERATOR. Nathan  
Sulzberger, New York, N. Y. Application

Nov. 9, 1933. Serial No. 697,265. 4 Claims.  
(Cl. 62-113.)

2,024,721. DEVICE FOR REGULATING  
THE FLOW OF REFRIGERANTS IN  
REFRIGERATING PLANTS. Richard  
John Cracknell, Park Royal, London, Eng-  
land, assignor to U. D. Engineering Co.,  
Ltd., London, England, a British company.  
Application Jan. 23, 1935. Serial No. 3,004.  
In Great Britain Sept. 7, 1933. 5 Claims.  
(Cl. 137-103.)

2,024,878. DEFROSTER. Michael B. Roy,  
Bridgeport, Conn. Application Sept. 12,  
1934. Serial No. 743,774. 3 Claims. (Cl. 20-  
40.5.)

2,024,977. REFRIGERATOR. William  
Dodson McClellan, Richmond, Va. Appli-  
cation Jan. 31, 1931. Serial No. 512,724. 3  
Claims. (Cl. 62-108.5.)

### DESIGNS

97,851. DESIGN FOR A CABINET FOR  
A REFRIGERATOR. Albert Kahn, Detroit,  
Mich. Application Oct. 3, 1935. Serial No.  
58,825. Term of patent 3 1/2 years.

97,875. DESIGN FOR A REFRIGERA-  
TOR CABINET. John Tjaarda, Birming-  
ham, Mich., assignor to Briggs Mfg. Co.,  
Detroit, Mich., a corporation of Michigan.  
Application April 26, 1935. Serial No.  
56,588. Term of patent 14 years.

### PATENTS

HAVE YOUR patent work done by a  
specialist. I have had more than 25 years'  
experience in refrigeration engineering.  
Prompt searches and reports. Reasonable  
fees. H. R. Van Deventer (ASRE),  
Patent Attorney, 342 Madison Avenue,  
New York City.

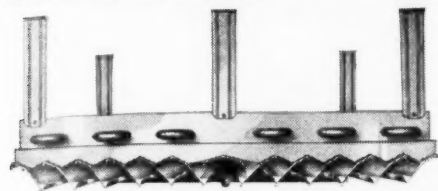
**LARKIN COILS**  
for  
**AIR CONDITIONING**



## The Buyer's Guide

Suppliers Specializing in Service to the  
Refrigeration and Air Conditioning Industries

### PEERLESS FLASH COOLER



The NEW Eye Appealing  
Method of Cooling Walk-  
In Refrigerators

### STYLE & RESULTS

Fin Coil and Drip Pans Engineered in an Integral  
Unit—Saves Installation Cost and Operating Cost

**PEERLESS ICE MACHINE CO.**  
CHICAGO TWO FACTORIES NEW YORK  
515 W. 35th St. 43-09 36th St., L.I.C.

### REFRIGERATOR CABINETS

4 to 14 Cu. Ft. Models in Stock

Also Specials for that Hard-to-Fit Location  
and For Apartments

Custom-Built at Production Prices

**HEINZ & MUNSCHAUER, Buffalo, N.Y.**

Makers of Quality Refrigerators Since 1865



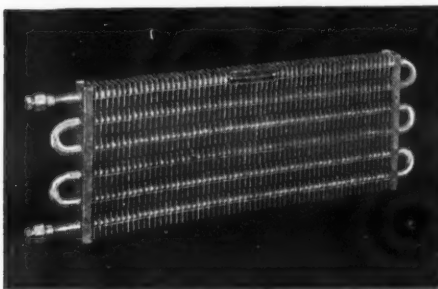
TYPE KR—  
12 MODELS

## RANCOSTAT

—the  
Stainless  
Steel  
Thermostat

Manufacturers of the Rancostat go to extremes to  
make sure of consistently accurate, dependable  
operation. For example, all knife edges are care-  
fully machined and precisely shaped to reduce  
friction and prevent variations. Every detail of  
construction is right—proved right in thousands of  
field tests as well as in the laboratory.

The Automatic Reclosing Circuit Breaker Co.  
Columbus, Ohio

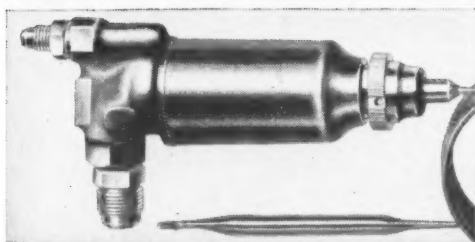


## REMPE FIN COILS

CHICAGO STATION D

Pipe Coils and Bends

### STANDARD REFRIGERATING APPLIANCES



### THERMOSTATIC EXPANSION VALVES

Write for bulletin on complete  
line covering refrigerating appli-  
ances, liquid line filters, dehydra-  
tors, acid neutralizers, standard  
parts and materials, service tools,  
shaft seals, bearing metals and  
parts. Descriptive literature will  
be gladly furnished on any or all  
of these lines on request.

**AMERICAN INJECTOR COMPANY** 1481-14th Street,  
Detroit, Mich.

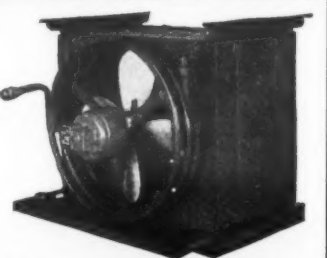
### KRAMER UNIT COOLERS

## Manifolded for FREON

Request Detailed  
Information & Prices

**TRENTON AUTO RADIATOR WORKS**

210-212 West 65th St. TRENTON 5114 Liberty Ave.  
New York City New Jersey Pittsburgh, Pa.



Units especially designed for  
FREON are manifolded and  
provided with drier coil.

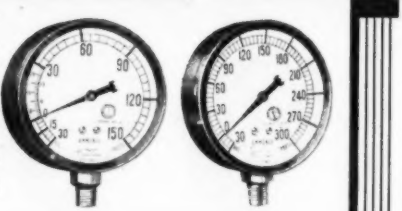
### Refrigeration Instruments by Marsh

MARSH AMMONIA GAUGES are the  
standard of the industry.

Constructed with oil hardened chrome  
molybdenum bourdon tube, stainless steel and  
monel metal movement, magnified reading dial  
and rust-proof construction throughout.

Manufactured in all standard dial sizes and  
pressure ranges. If so desired, these instruments  
can be furnished with dial reading in pounds  
pressure per square inch and corresponding  
temperature scale for ammonia and for Freon.

All Marsh ammonia gauges are constructed  
with zero adjustment feature.



**Jas. P. Marsh Corporation**  
2067 SOUTHPORT AVE., CHICAGO, ILL.

## Questions

### Compressor Makers

No. 2622 (Dealer, Ohio)—“We would  
like to find out where to locate manu-  
facturers of compressors. We refer  
particularly to compressors requiring  
1/4 hp. to 1/2 hp. and want only the  
compressor and not the other parts  
which usually go with it to make up a  
complete unit.”

“If you know of any manufacturers  
who sell this type of equipment we  
will appreciate receiving their names.  
We would ask, however, that you do  
not refer our name to these manu-  
facturers.”

Answer: The following companies  
are manufacturers of bare compres-  
sors:

American Engineering Co., 2420  
Aramingo Ave., Philadelphia, Pa.;  
Auburn Refrigeration Corp., Auburn,  
Ind.; Baker Ice Machine Co., 1518  
Evans St., Omaha, Neb.; Brunner  
Mfg. Co., 1821 Broad St., Utica, N. Y.;  
Commercial Refrigerator Mfg. Co.,  
1020 E. 59th St., Los Angeles, Calif.;  
Copeland Refrigeration Corp., 1331  
Holden Ave., Detroit, Mich.

Curtis Refrigerating Machine Co.,  
1936 Kienlen Ave., St. Louis, Mo.;  
Deissler Machine Co., N. Arch Way,  
Greenville, Pa.; General Refrigeration  
Sales Co., Beloit, Wis.; Hardy Mfg.  
Co., Inc., 100 Davis Ave., Dayton, Ohio;  
Kellogg Mfg. Co., 97 Humboldt St.,  
Rochester, N. Y.; Merchant & Evans  
Co., 21st and Washington Ave., Phila-  
delphia, Pa.

Nash Refrigeration Co., Inc., Sum-  
mit, New & Bleeker Sts., Newark, N.  
J.; Parker Mfg. Co., 2625 Santa Fe  
Ave., Los Angeles, Calif.; Reliance  
Refrigerating Machine Co., 3401 N.  
Kedzie Ave., Chicago, Ill.; Servel, Inc.,  
Commercial Refrigeration Div., Evans-  
ville, Ind.; The Starr Co., Richmond,  
Ind.; Tecumseh Products Co., Tecum-  
seh, Mich.; Universal Cooler Corp., 7424  
Melville Ave., Detroit, Mich.; and  
Zerozone Refrigeration Corp., 1331  
Holden Ave., Detroit, Mich.

A more complete list of these manu-  
facturers is published on pages 192  
and 193 of the 1935 REFRIGERATION  
AND AIR CONDITIONING DIRECTORY. This book  
is published for the purpose of giving  
such information.

### Air-Conditioned Bed

No. 2623 (Manufacturer, Illinois)—  
“In the magazine *Ice and Cold Stor-  
age*, (London) for November, 1935,  
there is a reference to an article in  
ELECTRIC REFRIGERATION NEWS—date not  
given—on the Clark-Air air-conditioned  
bed. We do not find the article in any  
issue since July, and would appreciate  
knowing the date it appeared.”

Answer: The story on the Clark-Air  
air-conditioned bed was published on  
page 4 of the October 16 issue of  
ELECTRIC REFRIGERATION NEWS.

### Majestic & Norge Service

No. 2624 (Service Man, New Jersey)  
—“Do you have in any of your past  
issues on service notes, any informa-  
tion pertaining to the hermetic Majes-  
tic and Norge units?”

Answer: An article on the Majestic  
Hermetic model refrigerator was pub-  
lished in the Aug. 16, 1933, issue of  
ELECTRIC REFRIGERATION NEWS. An  
article by K. M. Newcum, describing  
the Norge rotary compressor was pub-  
lished in the May 29, 1935, issue of  
the NEWS. This article is part of Chap-  
ter 4 of the forthcoming MASTER SER-  
VICE MANUAL.

### Asphalt Refrigerators

No. 2625 (Dealer, Spain)—“We would  
appreciate very much indeed if you  
send us names and addresses of the  
firms manufacturing Odorless Asphalt  
refrigerators like we build here.”

### Ice Cream Magazines

No. 2626 (Chain Grocery Corpora-  
tion, Tennessee)—“We would like to  
have you give us the name of any  
magazine that you would recommend  
that covers more specifically the sub-  
ject of the manufacture and distribu-  
tion of ice cream and related prod-  
ucts.”

Answer: The following publications  
cover the ice cream industry: *Ice  
Cream Field*; *Ice Cream Review*; and  
*Ice Cream Trade Journal*.

### Seal Assembly

No. 2627 (Manufacturer, Illinois)—  
“I am wondering if you can give me  
the names of the manufacturers of  
conventional type refrigerator com-  
pressors that use a seal assembly  
which is completely submerged in oil,  
the oil being supplied to the seal  
chamber by means of the splash or  
pressure lubrication systems.”

Answer: We regret we cannot give  
you the names of all manufacturers  
of conventional type compressors that  
use a seal assembly which is com-  
pletely submerged in oil.

In the instance that you may have  
skipped over it, we want to call your  
attention to the article in the Dec. 4  
issue of ELECTRIC REFRIGERATION NEWS

which covers methods of lubrication  
for present day refrigeration compres-  
sors. A large number of illustrations  
in this article show the types of lubri-  
cating systems that are being applied  
to various makes of refrigeration  
systems.

### Refrigerator & Range

No. 2628 (Manufacturer, Michigan)  
—“We have been informed by our  
English distributor that a cooker and  
refrigerator combination has become  
very popular abroad, and has asked  
us as to what is being offered in this  
country in that line.”

“If you happen to have some data  
in your files as to refrigerator and  
stove combinations, we will appreciate  
to have you furnish us with this in-  
formation, as we would like to get a  
full set of catalogs and specifications  
for our British associates.”

“Our distributor is also very much  
interested in complete kitchen lay-  
outs, that is, a complete set of kitchen  
equipment, including kitchen cabinet  
work, refrigerator, stove, etc., and he  
has asked us for drawings, specifica-  
tions, and costs of kitchen cabinet  
work, kitchen planning, and general  
equipment.”

“Could you furnish us with the  
names and addresses of manufactur-  
ers specializing in this kind of work?”

Answer: Electric Invisible Kitchen  
Co. manufactures a complete cabinet  
type electric kitchen, which includes  
an electric refrigerator and range.  
Their latest advertisement appears on  
page 6 of the November 6 issue of  
ELECTRIC REFRIGERATION NEWS.

General Electric has manufactured  
a small range and refrigerator com-  
bination.

General Electric Co. and Westing-  
house Electric & Mfg. Co. have been  
actively engaged in the planning of  
the complete all-electric kitchen, and  
have designed equipment for applica-  
tions of this type. Elgin Stove and  
Oven Co. of Elgin, Ill., has manufac-  
tured steel cabinets for such kitchens  
and may be of help to you.

### Gas & Kerosene Units

No. 2629 (Manufacturer, Illinois)—  
“We would like to have a list of man-  
ufacturers making gas and kerosene  
household refrigerator units and cabi-  
nets.”

Answer: Manufacturers of kerosene-  
operated refrigerators are: Electrolux  
Refrigerator Sales Division of Servel,  
Inc., Evansville, Ind.; Crosley Radio  
Corp., Arlington St., Cincinnati, Ohio;  
Gibson Electric Refrigerator Corp.,  
Greenville, Mich.; and Allyne Refrig-  
erator Corp., c/o Cleveland Tractor  
Corp., East 193rd St. and Euclid Ave.,  
Cleveland, Ohio.

### Display Trailer

No. 2630 (Dealer, New Jersey)—“We  
are interested in purchasing a display  
trailer which can be hauled by the  
average Sedan or Coupe, the interior  
to be especially adapted for display  
purposes.”

“Will you be good enough to furnish  
us with a list of manufacturers, if  
such a list is in your possession.”

“Will you also advise us whether  
you have a current list of the refrig-  
erator dealers, or stores handling re-  
frigerators for sale at retail, in the  
State of New Jersey, and if so, can  
we purchase a copy of this list from  
you.”

Answer: The following companies  
are manufacturers of trailers: Aerocar  
Co., 1815 Cabot Ave., Detroit, Mich.;  
Split Coach Motor Corp., York, Pa.;  
and Trotwood Trailers, Inc., Trotwood,  
Ohio.

An announcement of the mailing list  
for manufacturers' catalogs which we  
are preparing appeared in the Nov. 27  
issue of ELECTRIC REFRIGERATION NEWS.

### Air-Conditioning Guide

No. 2631 (Power Company, New  
York)—“We would like to obtain some  
sort of guide, giving a list of manu-  
facturers of both summer and winter  
air-conditioning equipment, and with  
specifications, if possible. We are under  
the impression that you have a guide  
meeting at least some of these re-  
quirements.”

“Will you kindly let us know what  
you have, and the price?”

Answer: A list of manufacturers  
of air-conditioning equipment may be  
found on pages 150 to 159 of the air-  
conditioning section of the 1935 RE-  
FRIGERATION AND AIR CONDITIONING DIR-  
ECTORY. Specifications for air-condition-  
ing systems were published in the  
March 27, 1935 issue of ELECTRIC RE-  
FRIGERATION NEWS.

On or about March 1, 1936, we are  
publishing a book entitled REFRIGERA-  
TION AND AIR CONDITIONING SPECIFI-  
CATIONS which will contain detailed  
specifications for air-conditioning sys-  
tems and for all models and makes  
of household and commercial refrig-  
eration equipment.

### Thompson's Position

No. 2632 (Manufacturer, Indiana)—  
“We are desirous of knowing if the  
chief engineer, Mr. Harry E. Thomp-  
son of Brunner Mfg. Co., Utica, N. Y.  
is the same Mr. H. E. Thompson who  
had charge of engineering with the  
Universal Cooler Corp. of your city.”

Answer: Yes.

## Classified

RATES: Fifty words or less, one inser-  
tion \$2.00, additional words four cents  
each. Three insertions \$5.00, additional  
words ten cents each.

PAYMENT in advance is required for  
advertising in this column.

REPLIES to advertisements with Box  
No. should be addressed to Electric  
Refrigeration News, 5229 Cass Ave.,  
Detroit, Mich.

### POSITIONS AVAILABLE

**SALESMEN WANTED.** Sales engineer  
now traveling east or central west or  
preferably both, to represent us calling on  
jobbers. Product has instant appeal and  
only awaits introduction. Three of largest  
jobbers in U. S. now handling with suc-  
cess. Give full information about yourself  
including territory traveled. Salary and  
commission. Box 751, Electric Refrigera-  
tion News.

**WANTED** commission men calling on  
refrigeration and washing machine trade,  
to handle Goodyear V-belts for replace-  
ment. Exclusive territories still available.  
Liberal commission. Prefer men selling  
allied lines. Write in detail to Detroit  
Rubber Products, Inc., 35 Parsons St.,  
Detroit, Mich.

### POSITIONS WANTED

**GENERAL EXECUTIVE**, experienced in  
all phases of manufacturing, national  
sales, finance, general management. Ten  
years in automobile industry, 15 years in  
refrigeration and air conditioning. Now  
connected with high grade complete line  
air conditioning with one of largest  
manufacturers. Will make change only for  
responsible function with substantial ex-  
panding firm that wants a dominant posi-  
tion in air conditioning industry. Box 754,  
Electric Refrigeration News.

**PRACTICAL ENGINEER** desires position  
operating boiler, steam, mechanical or low  
pressure refrigeration plant in apartment  
or business establishment. Has had techni-  
cal and practical training with several  
refrigerants. At present operating small  
refrigeration service station. Not particu-  
lar about location. References furnished  
on request. Box 755, Electric Refrigera-  
tion News.

### EQUIPMENT FOR SALE

**DEALERS AND SERVICEMEN.** We sell  
used refrigerators “As Is”. Recondition  
and spray them yourself and save money.  
Used Kelvinators \$19.00, Frigidaires \$25.00,  
Copelands \$22.50, Servels, \$19.00, Ice-O-  
Matics \$39.00, also General Electric, West-  
inghouse, Electrolux and many others.  
Some all porcelain. Pilgrim Refrigeration  
Co., 43-47 39th Place, Long Island City,  
N. Y.

**ISOBUTANE:** We offer purest and driest  
isobutane for the most exacting scientific  
purposes; in your 80 lb. cylinders at \$0.75,  
in our 120 lb. cylinders, \$0.70, in small lots  
at \$1.00 per pound. The Standard Refrig-  
eration Co. of Pittsburgh, 1148 Dohrman  
St., McKees Rocks, Pa.

### REPAIRS

**HALECTRIC** control repair service. All  
makes thermostatic and pressure controls  
rebuilt. Automatic and thermostatic ex-  
pansion valves repaired. Refrigerant gases  
carried in stock for rush shipment. War-  
renroll for stuck-up compressors. Rebuilt  
American Radiator Mercoid controls simi-  
lar to No. 848, five dollars each. Halectric  
Laboratory, 1793 Lakeview Rd., Cleveland,  
Ohio.

### HERMETIC UNITS REPAIRED

**GENERAL ELECTRIC SEALED UNITS**—  
repaired, rebuilt, exchanged. Guaranteed  
service. Our modern shop is especially  
equipped to efficiently repair these units.  
Prices low and workmanship the best.  
Give model number when writing. Imme-  
diate service. Rex Refrigeration Service,  
446 East 79th St., Chicago.

**HERMETIC UNITS** rebuilt or exchanged:  
Majestic all models \$17.50, Servel \$22.50,  
G.E. \$25.00 and \$32.50, other standard  
makes \$19.50. Majestic Hermetic Dome  
assembly \$12.50. Majestic standard com-  
pressors \$6.50, thermostat or cold control  
exchanged \$2.50. Other prices on request.  
Six months guarantee. Wholesale only.  
Refrigeration Products, Inc., 122 W.  
Illinois St., Chicago, Ill.

## VIRGINIA SMELTING Company

WEST NORFOLK, VIRGINIA

131 STATE ST. BOSTON-78 BEAVER ST. N.Y.

EXTRA DRY  
**ESOTOO**  
LIQUID SULPHUR DIOXIDE  
**V-METH-L**  
VIRGINIA METHYL CHLORIDE

### WE LEAD!

We are the leading school  
in the refrigeration field  
because we zealously  
maintain the highest pos-  
sible standard of training  
for men desiring to enter  
the industry and those  
already a part of it. Our  
object is to render service  
to all in a way that will  
make the industry glad  
we are associated with it.

**UTILITIES  
Engineering Institute**  
404 N. Wells St., Chicago  
1841 Broadway, New York  
Inquiries Solicited From Those  
Desiring Personal Training in  
the Services of Trained Men

